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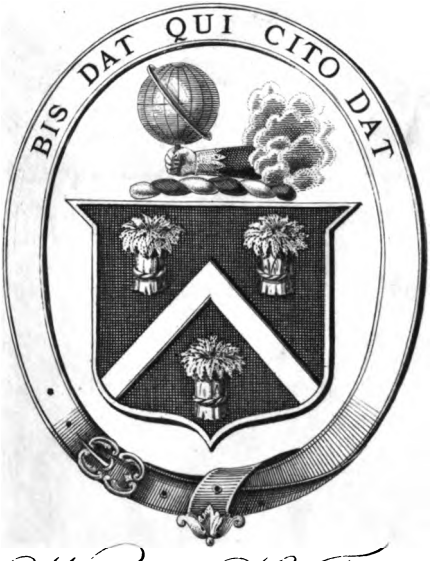

William H. Field.

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A man walks three miles an hour; a horse trots seven; steamboats run eighteen; sailing vessels make ten; slow rivers flow four; rapid rivers flow seven; moderate winds blow seven; storms move thirty-six; hurricanes, eighty; a rifle ball, 1,000 miles an hour; sound, 743; light, 190,000; electricity, 280,000. A barrel of flour weighs 196 pounds; a barrel of pork, 200; a barrel of powder, 25; a firkin of butter, 56; a tub of butter, 84; wheat, beans and cloverseed, 64 pounds to the bushel; corn, rye and flaxseed, 56; buckwheat, 52; barley, 48; oats, 35; coarse salt, 85; 60 drops make a drachm; 8 drachms make 1 ounce; 4 ounces make a gill; 60 drops make a teaspoonful; 3 teaspoonsful a tablespoonful, one-third of an ounce; 4,840 square yards make an acre; a square mile, 640 acres; to measure an acre, 209 feet on each side make a square acre within an inch. There are 2,750 languages. One person dies at each pulsation of the heart; a generation is thirty years; average of life, thirty-four years.

DOG DAYS

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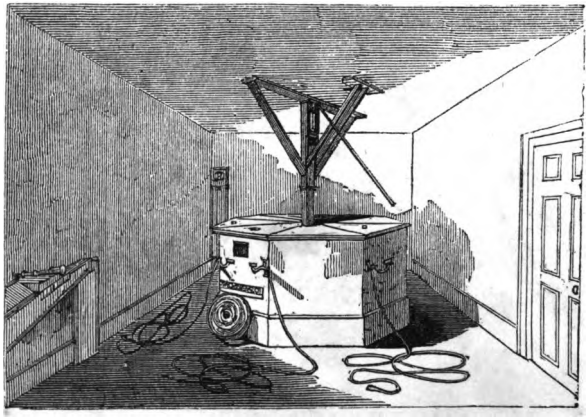
HOUSE IN TAVISTOCK PLACE IN WHICH MR. BAILY WEIGHED THE EARTH.



ROOM IN WHICH MR. BAILY WEIGHED THE EARTH.

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THINGS

NOT GENERALLY KNOWN,

Familiarly Explained.

A BOOK FOR OLD AND YOUNG.

By JOHN TIMBS, F.S.A.

AUTHOR OF "WALKS AND TALKS ABOUT LONDON," "CURIOSITIES OF HISTORY," ETC.

King Arthur's Round Table, at Winchester.

Eleventh Edition.—Thirty-Second Thousand.

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PREFACE TO THE NEW EDITION.

GENTLE READER,

The sale of Nineteen Thousand copies of the present volume within little more than Two Years of its publication proves its object and character to have been warmly recognised by the reading public.

As the taste of the day favours out-of-the-way reading, I have from its winding paths garnered into this little book a few of its stores for your special gratification. Although the result may not be recommended by the quaint fancy of the *British Apollo*, or the profundity of the *Athenian Oracle*,—the *Notes and Queries** of other days,—I have not been unmindful of the value of pith and point upon subjects which you are not asked to take for granted in every instance, but in many cases to weigh and consider.

You may, perhaps, say, "Your volume contains but a small portion of the 'Things not generally Known.'" Granted; but here are no fewer than FIVE HUNDRED groups of instances—in the main, from Popular Science and Antiquarianism: the Heavens and the Earth; the Sea and the Air; Sight and Sound; Life and Death; the Animal and Vegetable Kingdoms; the Origins of House and Home; the Festivals of our Calendar; historical glances at Laws and Customs; Dignitaries of Church and State; National Characteristics; Wonders of our Inventive Age; and a few Curiosities of the Art and Literature of early times.

This Edition has been corrected throughout; and several new Articles have been substituted for others of minor interest. For this improvement I am mainly indebted to friendly Correspondents.

To conclude with Montaigne's words of charming simplicity: "I am wise enough to know, by the measure of my own abilities, that my soil is incapable of producing any of those rich flowers that are here set and growing; and that all the fruits of my own growth are not worth any one of them."

I. T.

* This work, commenced by my fellow antiquary and bibliographer, Mr. W. J. Thoms, in 1849, is now flourishing, not only learned in itself, but the source of much learning in others. To Mr. Thoms, however, as the originator of this "medium of intercommunication," authors as well as readers are specially bound to be grateful.

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NOTE.

THE DEAD SEA (p. 27).—Baron Humboldt states (*Aspects of Nature*, vol. ii.), in opposition to the generally received opinion of the entire absence of organic life in the Dead Sea, that there have been found in it fine specimens of the coral-animal, *Porites elongata*.

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The Frontispiece.

ROOM IN WHICH THE EARTH WAS WEIGHED.

The remarkable physical investigations by which certain philosophers have explained the Motion and ascertained the Density of the Earth, are glanced at in pp. 16 and 17 of the present volume; where is noticed the result obtained by Mr. Francis Baily, the astronomer, who, in 1838, within a small room, "contrived a pair of scales that enabled him approximately to weigh the vast sphere,"—at his residence, No. 37 Tavistock Place. The house stands detached from any other building, in a large garden some distance from the street, the roadway of which is macadamised.

The building consists of one story only, and the room in which Mr. Baily conducted his experiments is at the N.E. angle of the first floor, and has only one window. It will be seen by the accompanying view that in the roof of the house is a small observatory; but the apartment we have to notice was preferred by Mr. Baily for the present experiments. Here he constructed apparatus differing in some respects from that with which Cavendish made his celebrated experiment, which Mr. Baily repeated under new circumstances, and with all the improvements of modern artists.

In the apparatus used by Mr. Baily, there were two small balls, about two inches in diameter, carried on a rod suspended by two wires at a small distance from each other. The positions of these balls were viewed from a distance by a telescope. When this was done, large balls of lead, which moved on a turning groove, were brought near the small balls. Observations were then made on the small balls again, and in every case the small balls were put into a state of vibration, and moved towards the large balls.

Now, knowing the size of the large balls, and their distance from the small balls, and knowing the size of the earth, and the distance of the small balls from its centre, the proportion of the attraction of the large balls on the small balls to the attraction of the earth on the small balls can be calculated; and from these results the mean density of the earth was found to be 5.67 times the density of water; that is, the average density of a cubic foot of the earth is more than 5½ times heavier than a cubic foot of water.

Having ascertained this result, and which agreed very nearly with the observations of Cavendish in the Schehallien experiments, all we want to know is, how many cubic feet there are in the earth. Now, taking the dimensions of the earth, as deduced from our best experiments, there are 259,800 millions of cubic miles in the earth; each cubic mile contains 147,200 millions of cubic feet; and each cubic foot weighs 5.67 times a cubic foot of water, which weighs about 62 lbs.; therefore, a cubic foot of the earth weighs about 354 lbs.; and 6,049,836 billions of tons are the weight of the whole earth.*

Such readers as are desirous of becoming acquainted with Mr. Baily's 2153 experiments and their results, are referred to vol. iv. of the *Transactions of the Royal Astronomical Society*, to the published Report of the inquiry, or to the *Year-Book of Facts*, 1843. In this room also Mr. Baily frequently made other experiments, recorded in the *Philosophical Transactions* for 1838. On these investigations we need not here enlarge, our object being in this place to record historically, by way of anecdote and illustration, *the building in which the earth was weighed, and its bulk and figure calculated.*

* This calculation, it will be seen, differs from that quoted at p. 17.

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The Vignette.

KING ARTHUR'S ROUND TABLE.

"And so great Arthur's seat ould Winchester prefers,
Whose ould round table yet she vaunteth to be hers."
DRAYTON'S *Polyolbion*.

Conspicuously upon the interior eastern wall of the County Hall at Winchester hangs the celebrated painted Table of King Arthur, the true history of which has long been a disputed question with antiquaries; but in 1845, when the Archæological Institute met at Winchester, an illustrative paper by Mr. E. Smirke was read upon this inquiry.

Tradition attributes the foundation of Winchester Castle to the renowned Prince Arthur; and the legendary bards affirm, that the large oaken table now shown as the chief curiosity of the place is the identical board around which that monarch and his celebrated knights assembled in the fortress he had founded: but the Exchequer Domesday shows that William I. erected the castle of Winchester in the situation in which exist its remains, including the County Hall, in which the Table hangs.

Mr. Smirke is not aware of any distinct reference to the Round Table before the reign of Henry VI. or Edward IV., when Hardyng, the poetic historian, alludes to the table of Arthur as "hanging yet" at Winchester; but this mention is not to be found in the earliest manuscript copy of Hardyng. Paulus Jovius informs us that the table was shown to the Emperor Charles V. on his visit to Winchester in 1522; and in the foreign accounts of Henry VIII. we find an entry of 66*l.* 16*s.* 11*d.* for the repair of the "aula regis infra castrum de Wynchestre et le round tabyll ibidem." Again, the table is referred to by a Spanish writer who was present at the marriage of Philip and Mary, as the Round Table constructed by Merlin.

The Table, as we now see it, consists of a circle, divided into twenty-five green and white compartments radiating from the centre, which is a large double (Norman?) rose. In the middle of the upper half of the circle, resting upon the rose, and extending to the double edge, is a canopied niche, in which is painted a regal figure, bearing the orb and sword, and wearing the royal crown. Around the centre rose is a circle inscribed with black-letter, except where it is broken by the base of the niche and the sitting king. There are also names inscribed in six of the white compartments, as well as in the circle around the compartments, of which however this circle is rather a continuation, in colour and form corresponding to the several divisions, each bearing a name. To what period these names are to be referred, Mr. Smirke leaves those to decide whose critical acquaintance with the cycle of the Round-Table romances will enable them to state the source from which the names are borrowed. But there is no doubt that, whatever retouching the table may have undergone (especially in the royal figure, which Mr. Smirke believes to have been repainted within the time of living memory), the form of the letters and general decorations of the table, even if we had no extrinsic evidence, would indicate a date not later nor much earlier than the reign of Henry VIII.

The table is made of very stout oak plank, and is larger than the roof and the floors of the rooms in the Eddystone Lighthouse; and considerably larger than the ground-plot of the parish church of St. Lawrence in the Isle of Wight.

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THINGS

NOT GENERALLY KNOWN.

Marvels of the Heavens.

THE GREAT TRUTHS OF ASTRONOMY.

How difficult must these be for the uneducated to understand! "Tell a plain countryman," says Bishop Hall, "that the sun, or some higher or lesser star, is much bigger than his cart-wheel, or, at least, so many scores bigger than the whole earth, he laughs thee to scorn, as affecting admiration with a learned untruth; yet the scholar, by the eye of reason, doth as plainly see and acknowledge this truth as that his hand is bigger than his pen."

ANCIENT IDEAS OF THE UNIVERSE.

Far lower down than the times of astrology and alchemy was the age when this earth was thought the fixed centre of the universe and an extended plain,* and the heavenly bodies glittering specks revolving round it; and when the great Aristotle taught that the heavenly bodies were bound fast in spheres which revolved with them round our earth—the bodies themselves being motionless—the first sphere being that in which the fixed stars are placed; then the five planets; the sun; and, next to the earth, the moon: the earth itself being at rest, and the centre of the universe!—*S. Warren, M.P., D.C.L.*†

MECHANICS OF ASTRONOMY.

Our acquaintance with the sublime truths of Astronomy would have been as deep had Eastern philosophers never turned

* This notion is not yet apparently banished from among ourselves even. "I remember," says the present Astronomer Royal, "a man in my youth—my friend was in his inquiries an ingenious man, a sort of philosopher—who used to say he should *like to go to the edge of the earth and look over.*" Airy's *Lectures on Astronomy*, p. 46, 2d edition, 1848.

† "The Intellectual and Moral Development of the Present Age," based upon a paper read to the Literary and Philosophical Society of Hull. 1853. Blackwood and Sons.

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their eyes to the realms of illimitable space, gazed enraptured on the canopy above, and watched the harmonious movements of the countless worlds which adorn the firmament they people. "The moment," says Sir John Herschel, "astronomy became a branch of mechanics, a science essentially experimental (that is to say, one in which any principle laid down can be subjected to immediate and decisive trial, and where the experience does not require to be waited for), its progress suddenly acquired a tenfold acceleration; nay, to such a degree, that it has been asserted, and we believe with truth, that were the results of all the observations from the earliest ages annihilated, leaving only those made in Greenwich Observatory during the single lifetime of Maskelyne, the whole of this most perfect of sciences might, from those data, and as to the objects included in them, be at once re-constructed, and appear precisely as it stood at their conclusion. The operation, indeed, of Arabian knowledge of astronomy in the early ages was, perhaps, principally to lend a plausibility to astrology; the observers of stars, like Columbus predicting the eclipse, had the power of astonishing when they prepared to delude."

NATURE OF THE SUN.

The most recent observations confirm the supposition that the Sun is a black, opaque body, with a luminous and incandescent atmosphere, through which the solar body is often seen in black spots, frequently of enormous dimensions. A single spot, seen with the naked eye, in the year 1843, was 77,000 miles in diameter. Sir John Herschel, in 1837, witnessed a cluster of spots including an area of 3,780,000 miles. The diameter of the sun is 770,800 geographical miles, or 112 times that of the earth; its volume is 1,407,124 times that of the earth, and 600 times that of all the planets; and its mass is 359,551 times greater than the earth's, and 738 times greater than all the planets.

THE SOLAR SYSTEM ILLUSTRATED.

In order to convey to the mind of the reader a general impression of the relative magnitudes and distances of the parts of our system, "choose," says Sir John Herschel, "any well-levelled field or bowling-green. On it place a globe two feet in diameter, which will represent the sun; Mercury will be represented by a grain of mustard-seed, on the circumference of a circle 164 feet in diameter for its orbit; Venus, a pea, on a circle 284 feet in diameter; the earth, also a pea, on a circle of 430 feet; Mars, a rather large pin's head, on a circle of 654 feet; Juno, Ceres, Vesta, and Pallas, grains of sand, in orbits of from 1000 to 1200 feet; Jupiter, a moderate-sized orange, in a circle

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nearly half a mile across; Saturn, a small orange, on a circle of four-fifths of a mile; and Uranus, a full-sized cherry or small plum, upon the circumference of a circle more than a mile and a half in diameter. As to getting correct notions on this subject by drawing circles on paper, or, still worse, from those very childish toys called orreries, it is out of the question. To imitate the motions of the planets in the above-mentioned orbits, Mercury must describe its own diameter in 41 seconds; Venus in 4m. 4s.; the earth in 7m.; Mars in 4m. 48s.; Jupiter in 2h. 56m.; Saturn in 3h. 13m.; Uranus in 2h. 16m.; and Neptune in 3h. 30m.

IS THE SUN INHABITED?

If (says Arago) this question were simply proposed to me, Is the Sun inhabited? I should reply, that I know nothing about the matter. But let any one ask of me if the sun can be inhabited by beings organised in a manner analogous to those which people our globe, and I hesitate not to reply in the affirmative. The existence in the sun of a central obscure nucleus, enveloped in an opaque atmosphere far beyond which the luminous atmosphere exists is by no means opposed, in effect, to such a conception.

Sir William Herschel thought the sun to be inhabited. According to him, if the depth of the solar atmosphere in which the luminous chemical action operates should amount to a million of leagues, it is not necessary that the brightness at each point should surpass that of an ordinary aurora borealis. In any case, the arguments upon which the great astronomer relies, in order to prove that the solar nucleus may not be very hot, notwithstanding the incandescence of the atmosphere, are neither the only, nor the best, that might be adduced. The direct observation, made by Father Secchi, of the depression of temperature which the points of the solar disc experience wherein the spots appear, is in this respect more important than any reasoning whatever.

Dr. Elliott maintained, as early as the year 1787, that the light of the sun arose from what he called a dense and universal twilight. He further believed, with certain ancient philosophers, that the sun might be inhabited. When the Doctor was brought before the Old Bailey for having occasioned the death of Miss Boydell, his friends, Dr. Simmons among others, maintained that he was mad, and thought that they could prove it abundantly by showing the writings wherein the opinions which we have just cited were found developed. The conceptions of a madman are in the present day generally adopted.—*Arago's Popular Astronomy*, vol. i. book xiv. chap. 29.

Sir John Herschel concludes that the sun is a planet abundantly stored with inhabitants; his inference being drawn from the following arguments:

On the tops of mountains of a sufficient height, at an altitude where

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clouds can very seldom reach to shelter them from the direct rays of the sun, we always find regions of ice and snow. Now, if the solar rays themselves conveyed all the heat we find on this globe, it ought to be hottest where their course is least interrupted. Again, our aeronauts all confirm the coldness of the upper regions of the atmosphere. Since, therefore, even on our earth, the heat of any situation depends upon the aptness of the medium to yield to the impression of the solar rays, we have only to admit that, on the sun itself, the elastic fluids composing its atmosphere, and the matter on its surface, are of such a nature as not to be capable of any excessive affection from its own rays. Indeed, this seems to be proved by the copious emission of them; for if the elastic fluids of the atmosphere, or the matter contained on the surface of the sun, were of such a nature as to admit of an easy chemical combination with its rays, their emission would be much impeded. Another well-known fact is, that the solar focus of the largest lens thrown into the air will occasion no sensible heat in the place where it has been kept for a considerable time, although its power of exciting combustion, when proper bodies are exposed, should be sufficient to fuse the most refractory substances.

COMPARATIVE LIGHT OF THE SUN AND THE FIXED STARS.

Dr. Wollaston has inferred, from observations made by him, that the direct light of the Sun is about one million times more intense than that of the full Moon; and therefore very many million times greater than that of all the fixed stars taken collectively. In order to compare the light of the sun with that of a star, he took, as an intermediate object of comparison, the light of a candle reflected from a small bulb, about a quarter of an inch in diameter, filled with quicksilver, and seen, by one eye, through a lens of two inches focus; at the same time that the star or the sun's image, placed at a proper distance, was viewed by the other eye through a telescope. The mean of various trials seemed to show that the light of Sirius is equal to that of the sun seen in a glass bulb one-tenth of an inch in diameter, at the distance of 210 feet, or that they are in the proportion of one to ten thousand millions; but, as nearly one-half of the light is lost by reflection, the real proportion between the light from Sirius and the sun is not greater than that of one to twenty thousand millions.

THE SUN'S LIGHT COMPARED WITH TERRESTRIAL LIGHTS.

When we place the flame of a wax-candle so that it is projected upon the regions of the atmosphere nearest the Sun's disc, it totally disappears, and we see merely the wick under the form of a black spot. This effect is still more strongly marked, as it ought to be, when the flame is projected upon the disc itself of the body. Whence we may deduce the conclusion, that the brightness of this flame is less that of a corresponding portion of the sun than that of a corresponding portion of the surrounding atmosphere, and that it does not

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form even 1-30th of the latter. Now, the intensity of the atmospheric light being 1-500th of the light of the sun in the vicinity of that body, we see that the intensity of the flame of a wax-candle is only 1-30th × 1-500th, or the 15,000th part of the solar light.

The brightest light which man has been enabled to produce is that which has been named the electric light, which is engendered by the aid of the galvanic battery, the magnificent invention of Volta.

It is no exaggeration to assert that the electric light is comparable to the solar light; for if we project upon the sun's disc the light which is obtained by rendering incandescent two pieces of charcoal placed in communication with the two poles of a galvanic battery, we do not arrive at all at the result which is furnished by a wax-candle, or even a Carcel lamp. The electric light is not effaced in presence of that of the sun. According to the energy of the battery employed, we find that the electric light varies from the fifth part to the fourth of that of the sun; or, in other words, that it is equivalent to that diffused by a number of wax-candles varying between 3000 and 3750.

Let us add, that a Carcel lamp gives as much light as seven wax-candles: and that the light of a jet of gas is equal to that of nine wax-candles.

The reader will be pleased to remark, that we speak only of the brightness of the sun at the surface of the earth, and not of the intensity of the light of that body near its surface.—*Arago's Popular Astronomy*, vol. i. book xiv. chap. 25.

THE NEARER THE SUN THE GREATER THE COLD.

This phenomenon is explained by the sunbeams bringing to the earth both light and heat as they descend to warm the hottest valleys or plains, and passing through the upper strata of the atmosphere, but leaving them always of a temperature much below freezing. This low temperature is proved by the fact, that all lofty mountains, even under the equator, are capped with never-melting snows; and that the higher the peaks are, though, therefore, the nearer to the sun, the colder they are. Thus aeronauts, in their balloon-car, if they mounted very high, would be frozen to death if not protected by very warm clothing. Another fact of the very same kind is, that a glass globe full of cold water, or even a ball of ice, will, in the sun's rays, act as a burning lens.—*Dr. Neil Arnott.*

THE EARTH TRAVELLING ROUND THE SUN.

Mr. Samuel Warren thus illustrates our rate of transit through space in our journey round our central luminary,

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computed by one of our best practical astronomers: "While I was journeying from London to Hull, some 200 miles, the planet, on which we were creeping by steam-power, had travelled some 410,000 miles through space! So that we are, while I am speaking, whirling along, without being in the least physically sensible of it, at the rate of upwards of 68,000 miles an hour; more than a thousand miles a minute, and nineteen miles between two beats of a pendulum, or in a second of time.*

MAGNETIC RELATION BETWEEN THE EARTH AND THE SUN.

Mr. Faraday has demonstrated this by the remarkable fact that there is an *exact coincidence* between the variation of the Sun's spots and that of the Earth's magnetism,—a *decennial* change, the existence of which had been established by Colonel Sabine, in conformity with the results of careful observation made by MM. Swabe and Lamart on the corresponding variations of the Sun's spots and the magnetic needle.—*Samuel Warren, D.C.L.*

COMPARATIVE LIGHT OF THE SUN AND MOON.

The splendour of Solar Light is more than 300,000 times that of the Full Moon: in other words, if the firmament were paved with 300,000 full moons, their united splendour would be inferior to that of the sun.

ECCENTRICITY OF THE MOON.

An eminent German astrologer concludes, from long study, that the centre of gravity of the Moon is sixty miles on one side of the centre; the effect of which would be, that the side visible to us may be regarded as a vast mountain sixty miles nigh, while the other side—that which we do not see—may have all the water and all the atmosphere. Hence our satellite may not be so devoid of these two elements as is commonly believed. The very irregularities of the moon were, in Galileo's opinion, a proof of Divine wisdom; for, had its surface been absolutely smooth, it would have been "but a vast and unblessed solitude, void of animals, of plants, of cities, and of men,—the abode of silence and inaction, senseless, lifeless, soulless, and stripped of all those ornaments which now render it so varied and so beautiful."—*Sir David Brewster.*

At the time of the death of Jesus Christ it was very near full moon. Now, when the moon eclipses the sun, it is neces-

* While the earth moves 68,305 miles an hour, Mercury moves more than 100,000 miles; whence chemists use his symbol to denote *quick*silver. While we are disposed to regard this as a rapid motion round the sun, what must the inhabitants of Neptune, who travel only three and a half miles a second, think of us, who are whirling round the sun at six times the speed of Neptune!

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sarily new. The Eclipse of the Passion, then, was the effect of a miracle.—*Arago.*

HEAT FROM THE MOON.

M. Melloni has proved, beyond doubt, that the rays of the Moon give out a slight degree of Heat. He concentrated the rays with a lens, over three feet diameter, upon his thermoscopic pile, when the needle was found to deviate from 0° 6′ to 4° 8′, according to the phase of the moon.—*Letter from Melloni to Arago.*

THE HARVEST MOON.

In Olmsted's *Mechanism of the Heavens*, p. 169, are these remarks upon this phenomenon:

"About the time of the autumnal equinox, the Moon, when near her full, rises about sunset a number of nights in succession. This occasions a remarkable number of brilliant moonlight evenings; and as this is in England the period of Harvest, the phenomenon is called the Harvest Moon. The sun being then in Libra, and the moon, when full, being, of course, opposite to the sun, or in Aries, and moving eastwards in or near the ecliptic at the rate of about 13° per day, would descend but a small distance below the horizon for four or six days in succession,—that is, for two or three days before, and the same number of days after, the full; and would, consequently, rise during all these evenings nearly at the same time, namely, a little before or a little after sunset, so as to afford a remarkable succession of fine moonlight evenings."

AGE OF OUR PLANET.

It is supposed that the plants of the coal period required a temperature of 22° Reaumur; the mean now is 8°, or 14° less. By experiments on the rate of cooling lavas and melted basalt, it is calculated that 9,000,000 of years are required in the earth to lose 14° Reaumur. M. Hibbert puts the period at 5,000,000. But, supposing the whole to have been in a molten state, the time that must have elapsed in passing from a liquid to a solid state is fixed at 350,000,000 years.—*M. Boué.*

PLURALITY OF WORLDS.

The idea occurred even to Copernicus, that our heavy mundane sphere, which affords convenient and substantial support to the footsteps of man, might possibly be not the only body of this kind contained within the wide realms of universal space. He knew that, if he could get far enough away from its sunlit form, he must see it dwindle down to a shining point or star. He perceived that the transparent regions surrounding the earth are crowded with such shining points, which become visible when the observer is protected from the glare of the sun by the nocturnal shadow of the globe. He watched these shining star-points night after night, until he ascertained that some

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amongst them at least move in space, as the earth does, and round the sun. From these simple data, with the bold dash of genius, he leaped at once to the conclusion that man's world is not solitary in the infinite wilderness of space; that it has companions and brethren amidst the shining hosts of the sky; that there are other orbs of substantial material, whirling in the sunshine, and capable of affording all the conditions which life of the highest kind needs for its development and support. In this way arose the idea of a Plurality of Worlds.—*Edin. Rev.* No. 208.

NUMBER OF STARS.

To our naked eye are displayed, it is believed, about 3000 Stars, down to the sixth magnitude; and of these only twenty are of the first, and seventy of the second, magnitude. Thus far the heavens were the same to the ancients as they are to ourselves. But within the last two centuries our telescopes have revealed to us countless millions of stars, more and more astonishingly numerous the further we are enabled to penetrate into space! Every increase, says Sir John Herschel, into the dimensions and power of instruments, which successive improvements in optical science have attained, has brought into view multitudes innumerable of objects invisible before; so that, for any thing that experience has hitherto taught us, the number of the stars may be really infinite, in the only sense in which we can assign a meaning to the word. Those rendered visible, for instance, by the great powers of Lord Rosse's telescope, are at such an inconceivable distance, that their light, travelling at the rate of 200,000 miles *a second*, cannot arrive at our little planet in less time than *fourteen thousand years!* Of this I am assured by one of our greatest living astronomers. Fourteen thousand years of the history of the inhabitants of these systems, if inhabitants there be, had passed away during the time that a ray of their light was travelling to this tiny residence of curious little man! Consider for a moment, that that ray of light must have quitted its dazzling source *eight thousand years* before the creation of Adam!—*Samuel Warren, D.C.L.*

DISTANCE OF THE EARTH FROM THE FIXED STARS.*

The light of the sun takes 160 minutes to move to the Georgium Sidus, the remotest planet of our own solar system; and so vast is the unoccupied space between us and the nearest fixed star, that light would require *five years* to pass through it. But as the telescope has disclosed to us objects many thousand

* The aborigines of New Holland regard the firmament more than civilised men would generally suppose. *They know the fixed stars by name, and believe them to be other worlds, inhabited.*

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times more remote than such a star, the creation of a new star at so great a distance could not become known to us for many thousand years, nor its dissolution recognised for the same length of time. Had the fleet messenger that was charged with the intelligence of its birth, or its death, started at the creation of the world, he would, at the present time, be only nearing our own planetary system.—*North British Review.*

Sir John Herschel tells us, that there are stars so infinitely remote as to be situated at the distance of twelve millions of millions of miles from our earth: so that light, which travels with a velocity of twelve millions of miles in a minute, would require two millions of years for its transit from those distant orbs to our own; while the astronomer who should record the aspect or mutations of such a star, would be relating, not its history at the present day, but that which took place two millions of years gone by.

The nearest (*a Centauri*), one of the brightest stars in the southern hemisphere, is at *twenty-one billions of miles* distance; that is, its light would require three years and a quarter to reach us. The second (61 *Cygni*) is not nearer than *sixty-three billions* of miles off, and its light requires upwards of ten years to reach us. These inconceivable distances have been measured to the utmost nicety, as the Astronomer Royal has explained, really by means of a common yard-measure! But what proportion is there between even these monstrous distances and those of the stars discovered by the great powers of Lord Rosse's telescope, the power of which we have just illustrated?

BINARY STARS.

We are now able to detect Binary, physically Binary stars; that is to say, a primary, with a companion continually revolving round it. "This," says Captain Smyth, "is the wonderful truth opened to view, that two suns, each self-luminous, and probably with an attendant train of planets, are gyrating round their common centre of gravity under *the same dynamical laws which govern the solar system;* that is, not precisely like our planets, round one great luminary, but where each constituent, with its accompanying orbs, revolves round an intermediate point or fixed centre! This is a great fact, and one which in all probability Newton himself never contemplated."

DISCOVERY OF THE PLANET "NEPTUNE."

Neptune was discovered optically by M. Galle, at Berlin, on the 23d Sept. 1846, by means of the theoretical indications of M. le Verrier, who expressed his conviction with a firmness which must be characterised as wonderful,—that the planet would be found exactly in a certain spot, and presenting

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exactly a certain appearance; and in that spot, and with that appearance, the planet was found. "Nothing," says Professor Airy, "in the whole history of astronomy can be compared to this."

ASTEROIDS AND RUPERT'S DROPS.

Mr. J. Nasmyth has compared the planet whose scattered fragments are supposed to form the Asteroids to a Rupert's Drop. It is in a state of fusion; the surface cools, hardens, and resists for a time the tension created by the contraction of the central portions. This tension becomes at length so strong, that the crust yields, as in the case of the Drop.

Mr. Hind has drawn attention to the singular fact, that the Asteroids "appear to separate the planets of small mass from the greater bodies of the system, the planets which rotate on their axes in and about the same time as our earth from those which are whirled round in less than half that time, though oftentimes the diameter of the earth; and (he continues) it may yet be found that these small bodies, so far from being portions of the wreck of a planet, were created in their present state for some wise purpose, which the progress of astronomy in future ages may eventually unfold."

THE MAGELLANIC CLOUDS

are a unique object in the universe of celestial phenomena, and one which, says Humboldt, "adds to the picturesque charms of the southern hemisphere, I might almost say to the elegance of the landscape. The two Magellanic clouds, which probably received, first from the Portuguese pilots, and subsequently from those of Holland and Denmark, the name of 'the Cape clouds,' attracted the attention of the voyager by their bright aspect; by their isolation, which renders them the more conspicuous; and by the revolution which they perform round the south pole, although at unequal distances from it. Their actual name is evidently derived from the voyage of Magellan, although he was not the first who observed them." They exhibit to the eye of the observer a sort of miniature of the celestial sphere; and there have been discovered in them constellations, clusters of stars, and nebulous matter in different degrees of condensation.

DANGER FROM COMETS.

Newton conjectured that Comets are "the aliment by which suns are sustained;" wherefore he concluded that these bodies were in a state of progressive decline upon the sun's round, which they respectively swept; and that in these they from time to time fell. By way of illustration he added, whenever the comet of 1680 shall fall into the sun, its "heat

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will be raised to such a point, that our globe will be burnt, and all the animals upon it will perish." Mr. Phillips, in his *Worlds beyond the Earth*, however, maintains:

"In the first place, *no comet*, out of the hundreds which have appeared, has shown any tendency to fall into the sun; they all regularly continue in their orbits, as the planets do. Again, the appearances which present themselves when a comet is in the close neighbourhood of the sun, rather manifest a *repulsion* between the matter of the comet and the sun. Again, if, as is most likely, the atomic constitution of a comet differ from that of the sun, it would not reach the surface. Were a comet to fall into the body of the sun, its mass is so trifling in comparison with that stupendous globe, that it would scarcely produce any appreciable effect; and, unless it consisted of gaseous matter which could unite chemically with that of the sun, no combustion would take place. The reverse might happen. No comet ever yet recorded, perhaps, contained the same amount of matter as the earth. Now, were the earth to fall into the sun, supposing it would burn, it would at most produce a small spark—a minute scintillation, and all would be over. Besides, the earth consists of substances which *have already been burned;* they would not burn again. The mass of a comet is so small that were it to come into collision with the earth it would suffer the most itself from the shock. The comets seem to take very good care of themselves. When we find that one comet has actually passed through the group of Jupiter's moons without deranging them in the least, we need not fear for our earth."

How strangely imagination will assist belief in the wildest absurdities, is proved by the ideas of the Epicureans, that the stars and the sun were extinguished every day in the west, and rekindled in the east; which notions, according to Cleomedes, "have for their foundation the tale of an old woman, according to which, the Iberians heard every evening the hissing noise made by the incandescent sun, as it was extinguished like a red-hot iron in the waters of the ocean." We remember to have been assured, when a child, by our nurse, a native of Sussex, that she had seen from the cliff at Eastbourne the Great Comet of 1769 descend and dip its tail into the sea with "a hissing noise!"

KEPLER'S "PROPHESYING ALMANAC."

On the reformation of the calendar, Kepler was summoned to the Diet at Ratisbon to give his opinion as to the subject, upon which he published a short essay. But though the government did not scruple to avail themselves of his services, yet his pension was allowed to fall in arrear; and, in order to support his family, he was compelled to publish an almanac, suited to the taste of the age; "to defray the expense of the Ephemeris for two years," says Kepler, "I have been obliged to compose *a vile prophesying Almanac*, which is scarcely more reputable than begging, unless from its saving the Emperor's credit, who abandons me entirely, and would suffer me to

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perish with hunger." Has this fact escaped the notice of those persons who have exposed the absurdities of our early almanacs? If so, it should be immediately appended to every exposure of the matter, so as to explain with whom rests the blame.*

SCEPTICISM OF LAPLACE.

Laplace's great intellect could occupy itself during a lifetime with the sublimest truths of astronomy to no better purpose than to deny the existence of the Almighty Maker of the universe; impiously to insinuate that the supposed useful purposes of our system could have been accomplished otherwise, and better, than at present! and, finally, to discard religion, and the sanctions which it derives from a future existence and its conditions, as a cruel imposture practised upon the ignorant credulity of mankind! It is right, however, to state, that M. Laplace, not long before his death, intimated to a distinguished English philosopher (Professor Sedgwick) a great change of opinion. Having spoken to him earnestly on the *religious* character of our endowments and course of academical study, M. Laplace added: "I think this right; and on this point I deprecate any great organic changes in your system; for I have lived long enough to know—what at one time I did not believe—that *no society can be upheld in happiness and honour without the sentiments of religion.*" This remarkable statement is made on the authority of Professor Sedgwick himself, who says it is in the very words of Laplace, "as nearly as I can translate them."—*Samuel Warren, D.C.L.*

THE DOOM OF OUR WORLD.

What this change is to be, we dare not even conjecture; but we see in the heavens themselves some traces of destructive elements, and some indications of their power. The fragments of broken planets—the descent of meteoric stones upon our globe—the wheeling comets welding their loose materials at the solar furnace—the volcanic eruptions of our own satellite—the appearance of new stars, and the disappearance of others—are all foreshadows of that impending convulsion to which the system of the world is doomed. Thus placed on a planet which is to be burnt up, and under heavens which are to pass away; thus treading, as it were, on the cemeteries, and dwelling in the mausoleums, of former worlds,—let us learn the lesson of humility and wisdom, if we have not already been taught it in the school of revelation.—*North British Review*, No. VI.

* A "Prophetic Almanac" has been published in London for the last thirty years!

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The Earth, its Surface and Interior.

THE AGE OF THE GLOBE.

Dr. Buckland, in his *Bridgewater Treatise*, quotes the following "Theories of the Age of the Globe." "The Earth," says Burnet, "was first inveiled with a uniform light crust, which covered the abyss of the sea, and which, being broken up for the production of the Deluge, formed the mountains by its fragments."—*Theoria Sacra.*

"The deluge," says Woodward, "was occasioned by a momentary suspension of cohesion among the particles of mineral bodies. The whole of the globe was dissolved, and the paste thus formed became penetrated with shells."—*Essay.*

"God raised up," says Schenekzer, "the mountains for the purpose of allowing the waters which had produced the deluge to run off; and selected those places in which were the greatest quantity of rocks, without which the mountains could not have supported themselves."—*Mém. de l'Académie.*

Whiston's "New Theory" is, that "the earth was formed from the atmosphere of one comet, and deluged by the train of another. The heat which it retained from its origin was the cause of exciting its inhabitants to *sin;* for which they were all drowned, except the fishes, which, having been fortunately exempt from the heat, remained innocent."

"The earth," says Leibnitz (*Protogæa*), "is an extinguished sun, a vitrified globe, on which the vapours, falling down again after it had cooled, formed seas, which afterwards deposited the limestone formations."

"The whole globe," says Demaillet, "was covered with water many thousand years. The water gradually retired. All the land animals were originally inhabitants of the sea. Man was originally a fish; and there are still fish to be met with in the ocean which are half-men, on their progress to the perfect human shape, and whose descendants will in process of time become men."

Buffon's "Théorie" is: "The earth was a fragment of the sun, struck off red-hot by the blow of a comet, together with all the other planets, which were also red-hot fragments. The age of the world, then, can be calculated from the number of years which it would take to cool so large a mass from a red-hot down to its present temperature. But it is, of course,

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growing colder every year; and, as well as the other planets, must finally be a globe of ice."

Lamarck says: "All things were originally fluid. The waters gave birth to microscopic insects; the insects, in the course of ages, magnified themselves into the larger animals; the animals, in the course of ages, converted a portion of the water into calcareous earth; the vegetables converted another portion into clay! The two substances, in the course of ages, converted themselves into silex; and thus the silicious mountains are the oldest of all. All the solid parts of the earth, therefore, owe their existence to life; and without life, the globe would be entirely liquid." This, too, is the favourite mode among the *German philosophers* of accounting for the formation and filling of the world.

"The earth," says Patrin, *Dict. d'Histoire Naturelle*, "is a great animal; it is alive; a vital fluid circulates in it; every particle of it is alive; it has instinct and volition, even to the most elementary molecules, which attract and repel each other according to sympathies and antipathies. Every mineral has the power of converting immense masses into its own nature, as we convert food into flesh and blood. The mountains are the respiratory organs of the globe! The schists are the organs of secretion; the mineral veins are *abscesses;* and the metals are products of disease, for which reason most of them have a repulsive smell."

Oken says: "All is done by polarisation."

NATURE OF THE EARTH.

Its polar and equatorial diameters differ by only 26½ miles; and the greater of the two—the equatorial—is 7925 miles. Hence our excavations are mere scratches of the exterior only; for our deepest mines have never penetrated lower than to the ten-thousandth part of the distance between the earth's surface and its centre. As far as scientific researches enable us to conjecture, we should conclude that when *our earth was first set in motion* it must have been somewhat soft, in order to have produced its present undoubted spheroidal form. But *what is the real nature of the earth's interior?* Transcendental mathematics fully recognise the principle of interfluidity or fusion; while all actual observations point to the existence of heat in a greater degree the lower we go. M. Humboldt, indeed, tells us that at only thirty-five miles distance from the earth's surface, "the central heat is every where so great, that *granite itself is held in fusion!*"

ROTUNDITY OF THE EARTH.

The truth of this doctrine is familiarly illustrated by the

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phenomena of the heavens, as well as by terrestrial appearances. Indeed, the spherical form of the earth is the fundamental principle of all mathematical geography. But it has been asked how the earth can remain suspended in the air without any support? Let us look upon the heavens, and observe how many other globes roll in space. The force which supports them is unknown to us; but we see its effects, and we investigate the laws according to which these effects take place. Let us, then, lay aside all uneasiness concerning the *antipodes*, that is, the people of the earth whose feet are turned towards ours: there is upon the globe neither high nor low; the antipodes see, in like manner as we do, the earth is under their feet, and the sky over their heads.

Homer supposed that under the earth was placed a range of columns guarded by Atlas; the Scandinavians believed the earth to rest upon nine pillars; and the worshippers of Bramah thought our globe supported upon four elephants. Upon what would these elephants or these columns rest? Our thoughts, however far they proceed, must always at length stop short, and affrighted, recoil from that infinity which surrounds us on every side, and which it is folly to attempt to comprehend. But some more reasonable observers will say: Do not the Andes and the Alps make it evident that the earth is an irregular body, and not all round? We answer: one of the highest mountains known is Chimborazo, in Peru, which rises to 21,424 feet above the surface of the sea. This height is nearly $\frac{1}{3000}$ of the earth's greatest circumference, and $\frac{1}{1900}$ of its axis. Upon an artificial globe of 21 feet in circumference, or of 6¾ feet in diameter, Chimborazo could only be represented by a grain of sand less than one-twentieth of an inch in thickness. Irregularities so imperceptible do not deserve to be taken into consideration.—*Maltebrun.*

THE THREE MOTIONS OF THE EARTH.

The Earth is believed by all our great astronomers to have, at this moment, not two motions only, but *three!*—one round its axis, which we can make evident to the very eye; another round the sun; but what of the *third?* A most remarkable, and equally mysterious fact: that the sun and all his planets are moving with prodigious velocity through space at the rate of a hundred and fifty millions of miles a-year, towards a particular point in the heavens, a star [λ] in the constellation Hercules!—*Sir W. Hamilton.*

MAGNITUDE OF THE EARTH.

The circumference of the globe is twenty-five thousand and twenty miles. It is not so easy to comprehend so stupendous

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a circle as to put down its extent in figures. It becomes more palpable, perhaps, by comparison such as this: A railway train, travelling incessantly, night and day, at the rate of twenty-five miles an hour, would require six weeks to go round it. The cubical bulk of the earth is two hundred and sixty thousand millions of cubic miles. Dr. Lardner says: "If the materials which form the globe were built up in the form of a column, having a pedestal of the magnitude of England and Wales, the height of the column would be nearly four and a half millions of millions of miles. A tunnel through the earth from England to New Zealand would be nearly eight thousand miles long."

SURFACE OF THE EARTH ILLUSTRATED.

The inequalities on the earth's surface arising from mountains, valleys, buildings, &c., have been likened to the roughness on the rind of an orange, compared with its general mass; and the comparison is quite free from exaggeration. The highest mountain known does not exceed five miles in perpendicular elevation: this is only 1-1600th part of the earth's diameter; consequently, on a globe of sixteen inches in diameter, such a mountain would be represented by a protuberance of not more than one-hundredth part of an inch, which is about the thickness of ordinary drawing-paper. Now, as there is no entire continent, or even any very extensive tract of land, known, where the general elevation above the sea is any thing like half this quantity, it follows, that if we would construct a correct model of our earth, with its seas, continents, and mountains, on a globe sixteen inches in diameter, the whole of the land, with the exception of a few prominent points and ridges, must be comprised on it within the thickness of thin writing-paper: and the highest hill would be represented by the smallest visible grain of sand.—*Sir John Herschel.*

WEIGHT OF THE EARTH.

Copernicus first distinctly demonstrated that the apparent terrestrial plain was really a free and independent material mass moving in a definable path through space. Then Newton explained that this independent mass moved through space because it was substantial and heavy, and because it was unsupported by props and chains; that, in fact, as a massive body, it is falling for ever through the void; but that, as it falls, it sweeps round the sun in a never-ending circuit, attracted towards it by magnet-like energy, but kept off from it by the force of its centrifugal movement. Next, Snell and Picard measured the dimensions of the heavy and falling mass, and found that it was a spherical body, with a girdle of 25,000 miles. Subsequently to this, Baily contrived a pair of scales

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that enabled him approximately to weigh the vast sphere; and he ascertained that it had within itself somewhere about 1,256,195,670,000,000,000,000,000 tons of matter.* To these discoveries Foucault has recently added demonstration to the actual senses of the fact, that the massive sphere is whirling on itself as it falls through space, and round the sun, so that point after point of its vast surface is brought in succession into the genial influence of its sunshine, an inverting atmosphere of commingled vapour and air is made to present clouds, winds, and rain, and the inverted surface to bear vegetable forms and animated creatures in great diversity. The world is, then, a large solid sphere, invested with a loosened shell of transparent, elastic, easily moving vapour, and whirling through space within the domains of sunshine; so that by the combined action of the transparent mobile vapour and the stimulant sunshine, organised creatures may grow and live on its surface, and those vital changes may be diffused, amongst which conscious and mental life stand as the highest results.—*Edinburgh Review*, No. 208.

GEOLOGICAL THEORIES.

Dr. Hutton's (Plutonic) views respecting the construction and revolutions of the Earth, though at first opposed with great vehemence, are in fact the same with those now almost universally received. Meanwhile, Cuvier, his contemporaries and successors, have produced new facts and results, in departments of inquiry almost unknown to Hutton, but harmonising beautifully with his views, respecting the fossil contents of the strata; their relations to the existing forms of organised beings; the succession of fossil species; and the various analogies between several existing causes, and those which operated during former conditions of the globe.

Aristotle's geological theory, viz. that the causes which produce geological phenomena are in constant and gradual operation, appears to be the most consonant to observation of any which have been proposed. It was received by the celebrated John Ray, whose physico-theological discoveries have been too much neglected by those who have written subsequently upon geology. Now, the theory of Lyell is that of Aristotle and John Ray, brought down to the present state of our knowledge.

"THE SILURIAN SYSTEM"

is the geology of the border-counties of Wales and England, and has been so named from these counties being the *Siluria* of Caractacus. Sir Roderick Murchison, the founder of this System, has demonstrated that, independently of all local or uni-

* See Frontispiece to the present volume.

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versal distinctions, the silurian rocks contain vast quantities of organic remains, a *fauna* of their own, totally distinct, except in a very few individual instances, from the fossils of the overlying systems. It is by the establishment of this fact that he is authorised to claim for his *system* the remarkable individuality and extension of character which justifies its separation from all the earlier deposits, and has enabled other geologists already to identify it in other parts of the earth's surface, of which it constitutes a not inconsiderable portion.

TEMPERATURE OF THE INTERIOR OF THE EARTH.

The increase of Temperature observed is about 1° Fahr. for every fifteen yards of descent. In all probability, however, the increase will be found to be in a geometrical progression as investigation is extended; in which case the present crust will be found to be much thinner than we have calculated it to be. And should this be found to be correct, the igneous theory will become a subject of much more importance, in a geological point of view, than we are at present disposed to consider it. Taking, then, as correct, the present observed rate of increase, the temperature would be as follows:

Water will boil at the depth of 2430 yards.
Lead melts at the depth of 8400 yards.
There is red heat at the depth of 7 miles.
Gold melts at 21 miles.
Cast iron at 74 miles.
Soft iron at 97 miles.

And at the depth of 100 miles there is a temperature equal to the greatest artificial heat yet observed; a temperature capable of fusing platina, porcelain, and indeed every refractory substance we are acquainted with. These temperatures are calculated from Guyton Morveau's corrected scale of Wedgwood's pyrometer; and if we adopt them, we find that the earth is fluid at the depth of 100 miles from the surface; and that even in its present state very little more than the soil on which we tread is fit for the habitation of organised beings.

HOW THE BASALTIC CAVE AT STAFFA WAS FORMED.

Professor Sedgwick's explanation of this phenomenon is, that Staffa was once in a fluid state, and red hot; but that in cooling, under great pressure, crystallisation commenced. In this operation there were central points from which the crystals sprang, forming a mass of spheres or globes, which, on being compressed closely together, would assume a hexagonal form. Vast tracts of mud are found to solidify in the same manner; and the earthen vessel in a glass-house, which is suffered to cool gradually, exhibits the same formation in passing from a fluid state to that of a solid body.

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SCIENCE *v.* ANTIQUARIANISM.

The puerilities of antiquarian zeal are often demolished by the powerful battery of Science. Thus, Professor Buckland, the distinguished geologist, laughed at the antiquaries' notions of Druids' stones, which have been stolen from the irregular surface-wells (pits in chalk, *puits naturels*) of the geologists.

AN EARTHQUAKE INDICATOR.

It has been proved at Ariquipa, where Earthquakes are very frequent, that if to a magnet be suspended by attraction a little fragment of iron shortly before the occurrence of the earthquake, the magnet will lose its power and the iron will fall. Dr. Buckland states, that in certain places liable to earthquakes, their extent has been measured by *bowls of treacle*, the inclination of the treacle in the bowl showing the quantum of shock! Again, a watchmaker in Scotland placed a clock against each of the four walls of an apartment, and marked the centre of the disc of the pendulum with chalk: when the shock took place, the derangement caused the pendulum to strike against the back and front of the clock-case, and thus to leave a mark indicative of the phenomenon, though not of its amount.

Mr. Babbage has observed, that the degree to which the shock of an earthquake is felt depends greatly on the strata or description of rock on which the observer is standing; and Dr. Buckland states, that Chichester, in Sussex, is more liable to earthquakes than any other place in the kingdom, in consequence of its being on the continuation of the Isle of Wight formation.—*Proceedings of the British Association*, 1841.

FORMER UNION OF AFRICA AND EUROPE.

Africa, a flat line of desert sand, rises abruptly out of the sea in a tremendous jumble, backed by the eternal snows of the Atlas. Two continents lie before us: we have reached the extremities of the ancient world. The separated continents stand aloof; they were once united; a dreary sea now flows between them, and separates them for ever. The straits are narrowest at Tarifa, and do not exceed twelve miles across: and their gradual widening is historically certain. That the two continents were united is proved by geological evidence. Tradition refers the cutting through the isthmus to Hercules, that is, to a canal opened by the Phœnicians, who were acquainted with those of Suez and Sesostris. Scylax, who wrote five centuries before Christ, estimated the breadth at half-a-mile; Euctemon, who wrote 100 years after Scylax, at four miles; Turranius Gracilis, a Spaniard, who lived on the spot three

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centuries later, and is quoted by Pliny, at five; Livy and Cornelius Nepos, at six; Procopius at ten; and Victor Vitensis at twelve. The elevated coast on each side has rendered further enlargement impossible.—*Quarterly Review*, No. 126.

SEPARATION OF ENGLAND FROM THE CONTINENT.

Geologists refer the separation of England from France to physical features. Sir H. Delabeche contends that it has not been a violent movement, but one of a long period of time; breakers must have been chiefly instrumental in removing the materials which once filled up the channel. Dr. Buckland doubts whether the separation of the Straits of Dover has taken place within the historic period; and Sir Charles Lyell considers it not historically but indefinitely remote.

ORIGIN OF AMBER.

Amber is found in many countries. It is particularly abundant on the shores of the Baltic; but is also found in Sicily, the Indian Seas, China, Siberia, North America, Madagascar, &c. The following facts show that the origin of amber goes back to the tertiary epoch, and that it is to be assigned to a resin which flowed from the trunk of certain trees of that era:

1st, We find amber in beds of tertiary lignites, in the form of numerous fragments lying between the trunks of amber trees. It is true that this substance has never been found adhering directly to any of the trunks; but the position of the fragments seems to admit of no doubt. 2d, The analogy between copal and amber evidently indicates a similar origin. Their consistency, their colour, their nature, and the fact that they both enclose organic remains, prove this resemblance; and concur in showing that amber, like copal, and many modern resins and gums, has flowed from the trunk and branches of a vegetable. It is probable that the large and irregular masses are the produce of the trunk, that the smaller ones have come from the branches, and that those which have a slaty structure have been formed by a series of layers. The roots probably produced none. The great quantity thrown up by the Baltic Sea is probably owing to the existence of a considerable bed, situate in the south-west quarter of the present basin of that sea, towards 55° north latitude, whence the winds convey it by diverging to the different points of the coasts of Prussia. This must have been the principal place where Baltic amber was formed, and the site of the forest which produced it. This forest probably flourished on a low island, which marine currents issuing from the north subsequently submerged and destroyed.

THE DELUGE.

Geologists are now converging to the opinion that there are no sensible vestiges of the Deluge upon the earth; and Dr. Fleming, who is of this opinion, contends also for its consistency with the truth of the Scriptural Deluge, in that it may have been brought upon the world without the alteration of

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any of its sensible features. And certain it is, that if the water from beneath came by openings in the bottom of the sea, or by the fountains of the great deep being broken up, one can imagine an elevation of level from this cause without any such disturbance on the surface of the earth as might affect aught that is visible either in its islands or continents. The stopping of the fountains of the deep would restrain the further increase of the flood from beneath; but unless there were other openings made by which a reflux could be effected, one does not see how the decrease of the flood and the subsidence of the waters to their former level can be accounted for. The sending forth of the dove, her finding no rest for the sole of her foot, her return to the ark, the projection of the hand through the window to pull her in, the second mission and return with the olive-leaf, altogether make up a very graphic representation. Wilkie, the painter, used to relate, that the ark experiment with a bird was tried with a dove from a balloon, and that it returned after it had been let out.—*Dr. Chalmers's Daily Scripture Readings.*

ANTEDILUVIAN ANIMALS.

The Animals of the Antediluvian World were not monsters: there was no lusus or extravagance. Hideous as they appear to us, and like the phantoms of a dream, they were adapted to the condition of the earth when they existed. We have the plesiosaurus, the plesiosaurus dolichodeirus; we have the ichthyosaurus and megalosaurus and iguanodon, pterodactyles with long and short beaks, tortoises, and crocodiles; and there were found among reeds and grasses of gigantic proportions algæ and fuci, and a great variety of mollusca of inordinate bulk, compared with those of the present day, as ammonites and nautili. Every thing declares that these animals inhabited shallow seas and estuaries, or great inland lakes; that the surface of the earth did not rise up in peaks and mountains, or that perpendicular rocks abounded in the seas, but that it was flat, slimy, and covered with a loaded and foggy atmosphere. There is, indeed, every reason to believe that the classes of mammalia and birds were not then created; and that if man had been placed in this condition of the earth, there must have been around him a state of things unsuited to his constitution, and not calculated to call forth his capacities. But, looking to the class of animals as we have enumerated them, there is a correspondence: they were scaly; they swam in water, or crept upon the margins; there were no animals possessed of rapidity of motion, and no birds of prey to stoop upon them; there was, in short, that balance of the power of destruction and of self-preservation which we seek now to obtain in higher animals

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since created, with infinitely varied instincts and means for defence and attack.—*Sir Charles Bell, on the Hand.*

CAUSE OF THE DIRECTION OF MINERAL VEINS.

Copper lodes have generally an easterly and westerly direction. Lead lodes commonly run from north to south, or nearly so. If, after a lode has been formed, it becomes dislocated, and one portion of it has its line of direction changed a few degrees by the movement of a portion of the earth's crust, by no means an unusual occurrence, the character of the mineral immediately undergoes a change. The main direction of the copper-lodes of Cornwall is from the north-east to the south-west, or nearly so; and these lodes contain, almost invariably, the yellow copper-ore. In the St. Just district, northward from the Land's End, by some great convulsion of nature, we find the ground greatly disturbed, and the mineral lodes have a direction from the south-east to the north-west; the copper-ore in all these mineral veins is the grey sulphuret, and they are very peculiarly characterised by the peroxide of iron which abounds. From these facts we learn, that the position determines, or, at all events, regulates, the character of the metalliferous deposits; one kind of mineral prevailing when the receiving fissure has been formed in one direction, and another when it has exhibited any deviation from that line. Phenomena of this kind appear to lead, as by a natural inference, to the conclusion, that some law of polarity has been at work; and we know of no physical force to which we can so appropriately refer the deposition of metalliferous ore in a rock-fissure as to electricity.—*Eclectic Review.*

ALL THE GOLD IN THE WORLD.

Estimate the yard of Gold at 2,000,000*l.*, which it is in round numbers; and all the gold in the world might, if melted into ingots, be contained in a cellar twenty-four feet square and sixteen feet high. All the boasted wealth already obtained from California and Australia would go into an iron safe nine feet square and nine feet high—so small is the cube of yellow metal that has set populations on the march, and roused the whole world to wonder.

The contributions of the people, in the time of David, for the Sanctuary exceeded 6,800,000*l.* The immense treasure David is said to have collected for the sanctuary amounted to 889 millions of pounds sterling (Crito says 798 millions)—a sum greater than the British National Debt. The gold with which Solomon overlaid the "most holy place," only a room thirty feet square, amounted to more than thirty-eight millions sterling.

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GOLD IN CALIFORNIA AND AUSTRALIA.

The following statement shows the value of Gold obtained in 5 years, chiefly by ordinary digging and washing, from two of the most productive gold regions in the world—California and the colony of Victoria :

California.

In 1851.	Value in round numbers	£6,898,500
1852.	„ „	9,155,800
1853.	„ „	10,781,400
1854.	„ „	10,302,000
1855.	Estimated (on nine months' produce)	8,644,000

The Colony of Victoria.

Part of 1851 and 1852.	Value in round numbers	£14,000,000
1853.	„ „	11,500,000
1854.	„ „	8,300,000
1855.	Estimated (on nine months' produce)	8,000,000

This statement has been prepared by Mr. Evan Hopkins, who anticipates that, by granting more liberal terms to systematic companies of diggers, increasing the facilities for obtaining and accumulating water, adopting improved modes of washing, &c. the produce of gold from the colony of Victoria alone would not fall much below the value of 6,000,000*l.* per annum for some years to come, which is about double the amount of gold now obtained from the Ural or Siberian gold-fields.

ARTESIAN WELLS.

These overflowing Wells were named from having been long known and practised in the province of Artois, in France. Their principle is the same as that of an artificial fountain. Thus, imagine a somewhat basin-shaped bed of sand, chalk, or any rock of a porous nature, to lie upon a stratum of clay impermeable to water, and to be covered by another stratum equally impermeable. The former bed, being saturated to a great extent by the water which flows into it from its higher and exposed edges—a hilly region, perhaps, where rain falls in abundance—becomes a reservoir, which, if an opening is bored down into it through the overlying clay, will discharge its waters upwards, with a force determined by the level at which they are kept in the reservoir, the rate at which they can percolate through its substance, and the size of the orifice; and in proportion as this reservoir is tapped by the borer, must the supply it affords on its upper margin be diminished.

EDIBLE EARTH.

The Ampo, or Tanah Ampo, an earthy substance eaten at Samarang and in Java, is in general solid and plastic, and is kneaded and formed into small rolls, which are dried over a charcoal fire, and eaten by the natives with great avidity, as a delicacy.

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The Sea.

DEPTH OF THE SEA.

Captain Sir James Ross, in his Voyage to the South, made some enormous soundings at sea; one of which, 900 miles west of St. Helena, extended to the depth of 5000 fathoms, or 30,000 feet, or nearly 5¾ miles; the weight employed amounting to 450 lbs. Another, made in lat. 33° 5′, and long. 9° W., about 300 miles west of the Cape of Good Hope, occupied 49½ minutes, in which time 2226 fathoms were sounded. These facts are thought to disprove the common opinion that soundings could not be obtained at very great depths.

Captain Denham sounded in the South Atlantic, between Rio de Janeiro and the Cape of Good Hope, 7706 fathoms, or nearly 7·7 geographical miles. Now, the highest summits of the Himalaya are little more than 28,000 feet. The sea-bottom has, therefore, depths greatly exceeding the elevation of the highest pinnacle above its surface.

The mean depth of the Sea is, according to Laplace, from four to five miles. If the existing waters were increased only by one-fourth, it would drown the earth, with the exception of some high mountains.—*Quarterly Review.*

SEA-PRESSURE.

In proportion to the descent into the Sea does the pressure of the superior portion on the inferior become greater; and as a column of sea-water, eleven yards in height, is nearly of the same weight as a column of air of an equal base, extending from the surface of the earth to the limit of the atmosphere, it follows that, at a depth of 1100 yards, the water sustains a pressure of 100 atmospheres. How enormous, then, must this pressure be on beds still lower, if the mean depth of the sea, at a distance from the coasts, extends for several miles, as the laws of gravitation seem to indicate!

QUANTITY OF SALT IN THE SEA.

The amount of common salt in all the oceans is estimated by Schafhäutl at 3,051,342 cubic geographical miles; or about five times more than the mass of the Alps, and only one-third less than that of the Himalaya. The sulphate of soda equals 633,644·36 cubic miles, or is equal to the mass of the Alps. The chloride of magnesium, 441,811·80 cubic miles; the lime

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salts 109,339·44 cubic miles. He supposes the mean depth to be about 300 metres, as estimated by Humboldt. Admitting with Laplace that the mean depth is from four to five miles, which is more probable, the mass of marine salt will be more than double the mass of the Himalaya.—*Silliman's Journal*, No. 16.

COLOURS OF THE OCEAN.

The usual tint of the Mediterranean Sea, when undisturbed by accidental or local causes, is a bright and deep blue; but in the Adriatic a green tinge is prevalent; in the Levant basin it borders on purple; while the Euxine often has the dark aspect from which it derives its modern appellation. The clear ultramarine tint is the most general, and has been immemorially noticed; although the diaphanous translucence of the water almost justifies those who assert that it has no colour at all. Seamen admit of one conclusion in regard to colour—namely, that a green hue is a general indication of soundings, and indigo blue of profound depth.—*Rear-Admiral Smyth, on the Mediterranean.*

"MOUNTAIN-HIGH" WAVES.

Some writers have asserted that the height of the Waves of the Ocean, from the trough to the crest, reaches often forty and fifty feet. But Dr. Arnott, in his *Elements of Physics*, affirms that no wave rises more than ten feet from the ordinary sea-level, which, with the ten feet that its surface afterwards descends below this, gives twenty feet for the whole height, from the bottom of any water-valley to the adjoining summit. From observations subsequently made with great care in the midst of the Pacific Ocean by the French Exploratory Expedition, it appears that Dr. Arnott was very near right. The maximum height was there found to be twenty-two feet.

The *longest wave* was met with by the Expedition in the south of New Holland, and was three times the length of the frigate, or 492 feet.

The *height of breakers* is enormous. Mr. Scott Russell states: "Few persons can realise the magnificent effect of standing on the cliffs of the west coast of Ireland, and observing the great breakers rolling in from the Atlantic, some of which, I have convinced myself, are fifty feet high, and occasionally they even reach the magnitude of 150 feet."*

* Although the height of the waves in a storm does not exceed twenty-two feet, the surf, half water and half spray, rises at times above the head of the Eddystone Lighthouse, which is ninety feet high, hooding the lantern in a watery shroud, and sometimes extinguishing the lights. At the Bell-Rock Lighthouse, the surf in a storm mounts to the lights, which are 100 feet above the ordinary level of the sea. At such times the column is felt to *tremble* when struck by the huge mass of the rolling waters.

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For measuring the heights of waves, the following plan is recommended by Mrs. Somerville: When the ship is in the trough of the sea, the person observing ascends the rigging until he can just see the crest of the coming wave on a level with the horizon, and the height of his eye above the ship's water-line will give a very fair measure of the difference of level between the crest and hollow of the sea; the mean of many observations being taken.

POWER OF OIL TO STILL ANGRY WAVES.

To test this alleged property in Oil, a Commission of the Royal Institute of the Pays Bas, in 1844, experimented upon a portion of the North Sea; when several gallons of oil were poured upon the restless waves without the effect of diminishing their motion; indeed, the phrase was stated by the Commission to be only a poetical embellishment.

On the other hand, Professor Horsford, by emptying a vial of oil upon the sea in a stiff breeze, stilled the surface; and Commodore Wilkes, in a violent storm off the Cape of Good Hope, witnessed the same effects from oil leaking out of a whale-ship.*

THE TIDES IN THE GERMAN OCEAN.

A striking example occurs of the happy connection of theory with observation, in the prediction that there must exist a spot in the German Ocean—the central point of an area of rotation produced by the meeting and mutual action of two opposite tides—where no rise or fall of tide whatever could occur—a prediction actually verified by Captain Hewett, in 1839, without any previous knowledge that such a point had been supposed to exist. This is one among the many triumphs of the kind achieved by modern science.—*Quarterly Review.*

LEVELS OF THE ATLANTIC AND PACIFIC OCEANS.

The popular notion which had so long prevailed that the Atlantic Ocean was many feet higher than the Pacific at the Isthmus of Panama, has been formally exploded. Colonel Totten has decided, after a series of careful tidal observations taken at Panama and Aspinwall Bay, and connected by accurate levels along the line of railroad, that the mean height of the two oceans is exactly the same; although, owing to the difference in the rise of tide of both places, there are, of course, times when one of the oceans is higher or lower than the other; but their mean level, that is to say, their height at half-tide, is now proved to be precisely the same.

* One of the most interesting results of Capt. Wilkes's United States' Exploring Expedition shows that the land-levels of the islands in the Pacific Ocean are entirely different in different islands; each island appearing to have a species

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THE BASIN OF THE ATLANTIC OCEAN.

The Basin of the Atlantic Ocean is a long trough, separating the old world from the new, and extending, probably, from pole to pole. This ocean-furrow was probably scored into the solid crust of our planet by the Almighty hand,—that there the waters which he called seas might be gathered together so as to let the dry land appear, and fit the earth for the habitation of man. From the top of Chimborazo to the bottom of the Atlantic, at the deepest place yet reached by the plummet in the Northern Atlantic, the distance in a vertical line is nine miles. Could the waters of the Atlantic be drawn off so as to expose to view this great sea-gash, which separates continents, and extends from the Arctic to the Antarctic, it would present a scene the most rugged, grand, and imposing. The very ribs of the solid earth, with the foundations of the sea, would be brought to light, and we should have presented to us at one view, in the empty cradle of the ocean, "a thousand fearful wrecks, with that fearful array of dead men's skulls, great anchors, heaps of pearl and inestimable stores, which, in the poet's eye, lie scattered in the bottom of the sea, making it hideous with sights of ugly death." The deepest part of the North Atlantic is probably somewhere between the Bermudas and the Grand Banks. The waters of the Gulf of Mexico are held in a basin about a mile deep in the deepest part. There is at the bottom of the sea, between Cape Vrace in Newfoundland and Cape Clear in Ireland, a remarkable steppe, which is already known as the telegraphic plateau. The great circle distance between these two shore-lines is 1600 miles: the sea along this route is probably nowhere more than 10,000 feet deep. — *Lieut. Maury.*

THE DEAD SEA

is so named from *no living object being found in it.* The northern bottom is almost flat; the greatest depth is 1128 feet; near the shore the bottom is generally a saline incrustation; intermediate are mud and cubes of pure salt. Its shores are covered with incrustations of salt, and footmarks in an hour's time become covered with crystallisations. Captain Lynch feels confident that the result of his expedition confirms to the very letter the History of the Holy Land, as regards the sunken cities.

THE BLACK SEA.

The reason for calling this Sea "Black" may have been the frequent recurrence of storms and fogs; but it also might have

of shell peculiar to its own formation. These shells could not have been derived from the continent, but must have originated on the respective islands where they were found.

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been the abounding black rocks in the extensive coal-fields between the Bosphorus and Heraclea.

WHAT IS THE GULF STREAM?

The Gulf Stream is believed by many to be nothing more nor less than the waters of the river Amazon, which is imbedded more than 1000 miles immediately under the equator; and all its tributary streams, for many thousand miles, are constantly pouring into this mighty reservoir their waters, which, being gathered under the burning sun of the equator, are extremely warm; and shoot out into the Atlantic more than a hundred miles, in face of the eternal trade-winds.

The Amazon is 60 miles wide; after being bedded in its irresistible course, it curves to the left, and scuds off before the strong trade-winds, till out of their reach. Driven along with great force, it takes its course round the great bay formed between the two continents of North and South America. Dashing along the northern coast of South America, and passing to the leeward of the West India Islands, it leaves the shores of Cuba, proceeding along the shores of Florida, the capes of Virginia, and the south coast of North America, and passing along the shores of Newfoundland, ends its mission among the icebergs which float out of the northern ocean. Cut off the Gulf Stream, and in a few years the North Atlantic would be filled with icebergs, and the port of New York would cease to be the centre of American commerce. Before the course of the Gulf Stream was known, the ships from Europe to New York, in winter, used to sail first to Charleston, S.C., and then coast it down to the Hudson; the voyage occupying from six to eight months. The Nantucket fishermen first discovered the course of the Gulf Stream; and while English captains took six months to reach New York, the fishermen used to make the run sometimes in a month. Vessels running north of this Stream in winter get their sails and rigging frozen, so that it is scarcely possible to make any headway. By their running into the Stream, they thaw out; for the water is always warm, and is known by this and its intense blue colour. Its influence renders the climate of Britain genial: were it diverted to break upon the coasts of Spain only, the British Isles would soon become a bleak, cold, and inhospitable region; and there is geological evidence to show that at one period when the Gulf Stream did not break upon the shores of Britain, it was as cold as Iceland.—*The Scientific American* (*abridged*).

THE "SARGASSO SEA."

Humboldt, from his own very careful researches, and from the comparison of the logs or journals of many English and

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French vessels, infers that the old and indefinite expression, Mar de Sargasso, includes two banks of fucus, of which the greater and easternmost one, of a lengthened shape, is situated between 19° and 34° north lat., 7° west of the island of Corvo, one of the Azores; while the lesser and westernmost bank, of a roundish form, lies between the Bermudas and the Bahamas (lat. 25° to 31°, long. 66° to 74°). A transverse band of the weed (*fucus natans*), running east and west, between 25° and 30°, connects the greater and lesser banks. These two groups, and the band of sea-weed, included under the old general name of the Sargasso Sea, occupy altogether a space exceeding six or seven times the area of Germany, and offering the most remarkable example of an assemblage of "social plants" of a single species. Columbus saw a part of these "oceanic meadows" in 1492, when his ship was surrounded by the sea-weed uninterruptedly from Sept. 16 to Oct. 8; and Humboldt's determination of the ship's place, while Columbus traversed the great meadows of sea-weed, is the more important, because we learn from it that for three centuries and a half this great accumulation, whether resulting from the local character of the bottom of the sea, or from the direction of the Gulf Stream, has remained the same in the ever-moving ocean.—*Aspects of Nature*, vol. i. pp. 63-66.

THE WATER TELESCOPE,

for seeing under water, consists of a tube to enable a person looking over the gunwale of a boat to rest the head on one end, while the other is below the surface of the water; the upper end being so formed that the head may rest on it, both eyes seeing freely into the tube. Into the lower end is fixed (water-tight) a plate of glass, which, when used, is to be kept under the surface of the water; so that the spectator, looking down the tube, sees all objects at the bottom whose reflective powers are able to send off rays of sufficient intensity to be impressed on the retina, after suffering the loss of light caused by the absorbing power of the water.* In clear water the bottom may thus be seen at the depth of 12 fathoms. This contrivance is much used in seal-shooting along our northern and western islands, where, sometimes in the form of an ordinary washing-tub with a piece of glass fixed in its bottom, the shot seal is looked for, and the grappling-hook let down to bring him to the surface. The Norwegian fishermen also often use this telescope when their anchors get into foul ground, or their cables warped on a roadstead.

* Light, in passing through pure sea-water, loses half its intensity for each 15 feet through which it passes.—*Sir John Leslie.*

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The Atmosphere.

WEIGHT OF THE ATMOSPHERE.

Pascal shows that all the phenomena and effects hitherto ascribed to the horror of a vacuum arise from the weight of the mass of air; and after explaining the variable pressure of the atmosphere in different localities, and its different states, and the rise of water in pumps, he calculates that the whole mass of air round our globe weighs 8,983,889,440,000,000,000 French pounds.

HEIGHT OF THE ATMOSPHERE.

The Height of our Atmosphere is a question much disputed. M. Biot conceives it to be 18 miles, Sir John Lubbock scarcely 22½ miles; some extend it to 50, others to 80, and Dr. Dick to 200 miles. The great meteor of February 11th, 1850, whose path was so admirably traced by Mr. Glaisher of the Royal Observatory, when first seen in the north of England, was at a height of 90 miles above the earth's surface, finally bursting in Bedfordshire, at an elevation of 23¼ miles; yet the noise resulting from the explosion was so loud as to be heard at the distance of more than 100 miles; not only proving that the body was of great size (Mr. Glaisher calculates it to be three-quarters of a mile in circumference), but that the atmosphere must have extended beyond this elevation. Most likely, the atmosphere extends to the height of about 50 miles; at 37 miles, according to Mrs. Somerville, it is sufficiently dense to reflect the solar rays when 18° below the horizon. The bursting of a meteor, whose diameter was half-a-mile, which occurred in the year 1783, at a height above the earth's surface of 50 miles, was heard like a cannon, although the air at that elevation is three thousand times lighter than that at the level of the sea.—*E. J. Lowe, F.R.A.S.*

COLOUR OF THE ATMOSPHERE.

The Colour of the Atmosphere is only apparent when we look at the sky, or at any distant mountain or forest; and a very simple experiment will explain the cause. If we take any large glass vessel, which contains a deep-coloured liquid, and have several glass tubes of different diameters, from an inch to a tenth or twentieth of an inch, and fill these tubes with liquid

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out of the large vessel; though we have the same liquid in all, it will be seen that the tint will gradually become more faint in proportion as the diameter of the tube is less, until, in the smallest, the liquid is clear and colourless like water. Hence, it will be observed, the intensity of the colour is in proportion to the mass; and that a very small quantity of that which in large quantities has a strong colour does not present any colour at all. This is the case with all semi-transparent substances; a small quantity cannot transmit to the eye a sufficient body of their peculiar colour to make an impression, and hence appears colourless.—*Hugo Reid.*

MEASUREMENT OF HEIGHTS BY THE BAROMETER.

The following interesting experiment upon altitudes has been made with Wollaston's thermometrical barometer, 552 parts upon the scale of which are equal to 530 feet in altitude. With this instrument, boiled on the counter of a bookseller's shop in Paternoster-row (between four and five feet above the foot-pavement on the north side of St. Paul's Churchyard), and boiled again in the golden gallery of the cathedral, there was a difference of 254 parts; the corrected height indicated therefore 276·64 feet. General Roy makes the gallery above the north pavement to be 281 feet, which, allowing five feet for the difference of station, brings the author's estimate to 267 feet, differing only four feet; or, by another calculation, founded on General Roy's statement, the difference is less than two feet.

WARMTH OF THE "SNOW BLANKET."

Much controversy existed as to the Warmth imparted to the earth by a covering of Snow, until M. Boussingault, during the winter of 1841-2, found that a thermometer plunged in snow to the depth of a decimetre (about four inches) sometimes marked nine degrees of heat greater than at the surface. —*Arago.*

A ROOM NEVER EMPTY.

If a Room present to our view only its naked walls, it is not literally empty: it is full of air, just as a boat sunk in a river is full of water; and if the room were perfectly air-tight, even an orange could not be thrust into it additionally without the force of half a hundred-weight.*

VENTILATION BY THE CHIMNEY.

A parlour-fire will consume in twelve hours 40 lbs. of coal,

* It is much easier to estimate the number of persons *filling* a room than a smaller number thinly scattered about the apartment. Each person may be considered to occupy a square of eighteen inches; and the dimensions of the room being known, a close approximation may be made to the number.

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the combustion rendering 42,000 gallons of air unfit to support life. Not only is that large amount of deleterious product carried away and rendered innoxious by the chimney, but five times that quantity of air is carried up by the draught, and ventilation thus effectually maintained. The ascent of smoke up a chimney depends on the comparative lightness of the column of air within to that of an equal column without: the longer the chimney, the stronger will be the draught, if the fire be sufficiently great to heat the air; but if the chimney be so long that the air is cooled as it approaches the top, the draught is diminished.—*Faraday.*

LONDON FOG.

The general cause of Fogs is the upper region of the atmosphere being colder than the lower, and thus checking the ascent of the aqueous vapour, and keeping it near the surface of the earth; and in London and other great cities where coal is burnt, the vast quantity of fuliginous matter floating over such places mingles with the vapour, and thus wraps the town in murky gloom at noonday. Sometimes this extraordinary appearance is caused by a change of wind, which may be accounted for as follows:—The west wind carries the smoke of the city to the eastward in a long train, extending to the distance of twenty or thirty miles; as may be seen in a clear day by any person on an eminence five or six miles from the city, and looking across in the direction of the wind; say from Harrow-on-the-Hill, for instance. In this case, suppose the wind to change suddenly to the east, the great body of smoke will be brought back in an accumulated mass; and as this repasses the city, augmented by the clouds of smoke from every fire therein, it causes the murky darkness alluded to.

By accurate observation of the height of the fog, relatively with the higher edifices, whose elevation is known, it has been ascertained that the fogs of London never rise more than from two hundred to two hundred and forty feet above the same level. Hence the air of the more elevated environs of the metropolis is celebrated for its pure and invigorating qualities; being placed above the fogs of the plain, and removed from smoky and contaminated atmosphere. The height of the Norwood hills, for example, is about 390 feet above the level of the sea at low water, and thus enjoys a pre-eminent salubrity.

LONDON SMOKE.

Smoke we have always with us. If we look out on a fine summer's day through the louvre-boards at the top of the Sydenham Crystal Palace for a view of the metropolis, we naturally exclaim, "I see it—there is the smoke!" This black and

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heavy cloud is supported by the 500,000 or 600,000 columns of smoke that arise from the 400,000 houses of London. In it we behold the great aerial coalfield, which contains annually no less than 200,000 tons of fuel that escape from us up our chimneys. Five centuries ago, the very condition to which the smoke nuisance has brought us was foretold, and attempts were made to avert it. Until the time of Edward II., London used only wood for fuel, drawn from the neighbouring forests. In this reign, however, coal began to be imported from Newcastle; and the effects of the smoke speedily showing themselves, Parliament in 1316 petitioned the king to prohibit its use in London, on the ground of its being a public nuisance; whereupon he ordered all who burnt sea-borne coal to be mulcted, and on a second offence to have their furnaces demolished. Like most unnecessarily severe orders, however, this speedily fell into abeyance, and the evil from that time has been going on apace. At the Restoration, there were only 200,000 chaldrons imported; in 1775, 500,000 arrived; a quantity which had increased to 900,000 at the beginning of the present century, and in 1854, upwards of 4,000,000 tons were received in the metropolis by land and sea.—*Times Journal.*

LIGHT OF THE SEASONS.

The chemical principle of the sun's rays is more active, relatively to heat and light, during the Spring than at any other period of the year. As Summer advances, this power diminishes, and luminous force increases; whilst with the Autumn both light and actinism are subdued, but the calorific radiations increased. Thus the conditions of the light of the seasons vary to suit the necessities of vegetable life. — *Robert Hunt, F.R.S.*

WHAT IS ACTINISM?

Actinism is a term signifying *ray-power*, which has been adopted for the purpose of expressing the chemical action of the sunbeam. According to the generally received views, the solar ray is regarded as exhibiting three forces: *light*, or luminous power; *heat*, or calorific power; and *actinism*, or chemical power: but whether these be regarded as distinct forces, or only as modified forms of one, the three phenomena are essentially dissimilar; hence the necessity of the term actinism, to distinguish the chemical (photographic) phenomena from heat and light.—*Robert Hunt, F.R.S.*

SKIES OF DIFFERENT COUNTRIES.

The different degrees of the rarefaction of the air, as well as the nature of terrestrial exhalations, tend to produce the

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varieties of Skies; and on these the beauty of a climate partly depends. The azure arch, which, by an optical illusion, on every side limits our view, seems to be lower in England than it is in France. In vain does the Italian, upon the borders of the Seine, look for that pure, serene, and boundless sky, that atmosphere of clear blue, or of vivid red, which so much contributed to inspire a Raphael and Correggio. But even the Italian sky is cloudy in comparison with that which, in summer, canopies the blissful islands of the Pacific Ocean, that paradise of the torrid zone.

HIGH TEMPERATURE OF ANCIENT EUROPE.

The fossil floras of France, England, Germany, and Scandinavia, exhibit ferns nearly fifty feet high, and with branches three feet in diameter, or nine feet in circumference. The lycopodia, which, at the present time, in cold or temperate regions, are creeping plants, scarcely rising above the surface; which, even at the equator, under the most favourable circumstances, do not rise to more than three feet,—reached in Europe, in the ancient world, to the height of eighty feet. One must be blind not to see in these enormous dimensions a new proof of the High Temperature formerly possessed by our country before the last irruption of the ocean.—*Arago's Eloge of Fourier.*

SIGNS OF THE WEATHER.

Sir Humphry Davy, in his *Salmonia*, explains several Weather proverbs, signs, and superstitions. Thus, when the clouds are purple-tinted red in the west, it portends fine weather, because the air, when dry, refracts more red or heat-making rays; and as dry air is not perfectly transparent, they are again reflected in the horizon. A coppery or yellow sunset generally foretells rain; but, as an indication of wet weather approaching, nothing is more certain than a halo round the moon, which is produced by the precipitated water; and the larger the circle, the nearer the clouds, and consequently the more ready to fall.

The old proverb:

> "A rainbow in the morning is the shepherd's warning,
> A rainbow at night is the shepherd's delight,"

is often correct, because a rainbow commonly occurs when the clouds containing or depositing the rain are opposite to the sun; now, in the evening the rainbow is in the east, and in the morning in the west; and as our heavy rains in this climate are usually brought by the westerly wind, a rainbow in the west indicates that the bad weather is on the road, by the wind, to us; whereas the rainbow in the east proves that the rain in these clouds is passing from us.

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When swallows fly high, fine weather is to be expected or continued; but when they fly low, or close to the ground, rain is almost surely approaching; for swallows follow the flies and gnats, which delight in warm strata of air. Now, as warm air is lighter, and usually moister, than cold air, when the warm strata of air are high there is less chance of moisture being thrown down from them by their mixture with cold air; but when the warm and moist air is close to the surface, it is almost certain that, as the cold air flows down into it, a deposition of water will take place.

When sea-gulls assemble on the land, very stormy and rainy weather is approaching. The cause of this migration to the land is the security of these birds finding food; and they may be observed at this time feeding greedily on the earth-worms and larva driven out of the ground by severe floods; whilst the fish on which they prey in fine weather in the sea leave the surface and go deeper in storms. The search after food is the principal cause why animals change their places. The different tribes of the wading birds always migrate when rain is about to take place. The vulture, upon the same principle, follows armies; and the augury of the ancients was doubtless a good deal founded upon the observation of the instincts of birds. There are many superstitions of the vulgar owing to the same source. For anglers, in spring, it is always unlucky to see single magpies; but two may be always regarded as a favourable omen: the reason is, that in cold and stormy weather one magpie alone leaves the nest in search of food, the other remaining sitting upon the eggs or the young ones; but two go out together, only when the weather is warm and mild, and favourable for fishing.

The singular connections of causes and effects make superstition less to be wondered at, particularly amongst the vulgar; and when two facts naturally unconnected have been accidentally coincident, it is not singular that this coincidence should have been observed and registered, and that omens of the most absurd kind should be trusted in. In the west of England, about a century ago, a particular hollow noise on the sea-coast was referred to a spirit or goblin, called Bucca, and was supposed to foretell a shipwreck. Now the philosopher knows that sound travels much faster than currents in the air; and the sound always foretold the approach of a very heavy storm, which seldom takes place on that wild and rocky coast without a shipwreck on some part of the extensive shore surrounded by the Atlantic.*

* In the 1st book of Kings, ch. xviii., is described a cloud which foretold wind as well as rain: "Behold there ariseth a little cloud from the sea, of the bigness of a man's hand. And it came to pass in the mean time, that the heaven

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Arago has left us this important dictum:—"*Whatever may be the progress of the sciences, never will observers who are trustworthy and careful of their reputation, venture to foretell the state of the weather.*"

LAW OF STORMS.

Colonel Sir W. Reid's theory, which regards tropical tornadoes as cyclones, or revolving masses of air travelling along certain curved lines, has been rarely so strikingly exemplified as by Captain Handley, of the *Sultany*. The edge of the cyclone referred to was 30° at least from Bombay, Calcutta, and Aden; and its effects were felt at the distance of 2000 miles. The course of the ship *Sultany* was south-west, when, overtaken by the storm, Captain Handley says in his log, "I furled the topsails and foresails, and rounded the ship to, with her head to the eastward, as I have every reason to believe I am on the N.E. edge of a hurricane." The storm passed onward to the S.W.; and thus, by laying to, and steering to the eastward, Captain Handley no doubt saved his ship and the 300 coolies on board. This is a triumph of scientific observation.

ANTIQUITY OF LIGHTNING-CONDUCTORS.

The art of bringing down lightning from the heavens seems to have been the only charm which the ancients possessed; and M. Salverte, in his work on the Occult Sciences, shows a probability that the ancients defended their buildings from lightning by conductors, and that the Temple of Solomon was thus protected.

PRECAUTIONS AGAINST LIGHTNING.

Franklin has given some precepts for the use of such persons as, during thunder-storms, are in houses not provided with lightning-conductors. He recommends them to avoid the neighbourhood of fireplaces. Lightning does, indeed, often enter by the chimney, on account of the internal coating of soot, which is one of the bodies for which, as for metals, lightning evinces a preference. For the same reason, avoid, as much as possible, metals, gildings, and mirrors on account of their quicksilver. The best place is in the middle of the room; unless, indeed, there should be a lamp or chandelier hanging from the ceiling. The less the contact with the walls or the floor, the less the danger. A hammock suspended by silken cords in the middle of a large room would be the safest place. In the absence of means of suspension, the next best place is on sub-

was black with clouds and wind, and there was great rain." Sir John Chardin informs us that, in his time, great storms were wont to begin with such a kind of cloud, and that it was the sign of them at sea in the Eastern countries.

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stances which are bad conductors, such as glass, pitch, or several mattresses. These precautions must be supposed to diminish the danger; but they do not altogether remove it. There have been instances of glass, pitch, and several thicknesses of mattresses, being traversed by lightning. It should also be understood that, if the lightning does not find round the room a continuity of metal which it may follow, it may dart from one point to another diametrically opposite, and thus encounter persons in the middle of the room, even if they are suspended in hammocks.—*Arago's Meteorological Essays.*

FORCE OF LIGHTNING.

On Aug. 1, 1846, St. George's church, recently built at Leicester, was entirely destroyed by the effects of a thunderstorm! The steeple was burst asunder, and parts of it were blown 30 feet; while the vane-rod and top part of the spire fell perpendicularly down, carrying with it every floor in the tower. Mr. Highton, in comparing the power of this discharge of lightning with some known mechanical force, states, that 100 tons of stone were blown a distance of 30 feet in three seconds; consequently a 12,220 horse-power engine would have been required to resist the effects of this single flash.

WHAT ARE LIGHTNING-CONDUCTORS?

In a Report made to Parliament in 1855, by Sir W. Snow Harris, he thus refutes the fallacy of the vulgar and unphilosophical assumption that Lightning-rods "attract" the lightning, and so act as efficient safeguards:

It is proved by an extensive induction of facts and a large generalisation in the application of metallic conductors, that metallic substances have not exclusively in themselves any more attractive influence for the agency of lightning than other kinds of common matter; but that, on the contrary, by confining and restraining the electrical discharge within a very narrow limit, the application of a small rod or wire of metal to a given portion of a building is, in reality, highly objectionable. Besides, the application of an ordinary lightning-rod is of a very partial character: it has small electrical capacity, and is very often knocked to pieces by heavy discharges of lightning. To secure such a building as the New Palace of Westminster against lightning, Sir W. Snow Harris considers it requisite to complete the general conductibility of the whole mass, and so bring it into that passive or non-resisting state which it would assume in respect of the electrical discharge supposing the whole were a complete mass of metal; by which means a discharge of lightning, in striking upon any given point of the building, would have, through the instrumentality of capacious electrical conductors, unlimited room for expansion upon the surface of the earth in all directions to which, by a law of nature, the discharge is determined.

TO ESTIMATE THE DISTANCE OF A STORM.

Observe how many seconds elapse between a flash of light-

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ning and the thunder, and multiply them by 1142, the number of feet sound travels in a second; the product will be the distance in feet.—*Illustration.* Saw a flash of lightning five seconds before I heard the thunder; required the distance.

$$\frac{5 \times 1142}{3 \times 1760} = 1\tfrac{43}{528} \text{ in distance.}$$

In the absence of a watch, the pulsations at the wrist may be counted as seconds, by deducting 1 from every 7 or 8.

Thunder can scarcely ever be heard more than 20 or 30 miles from the flash which produces it. Lightning, on the other hand, may be seen (or at least the reflection in the clouds, forming "sheet lightning") at a distance of 150 or 200 miles.—*Sir John Herschel.*

HOW TO MEASURE THE HEIGHT OF A MOUNTAIN.

The Atmosphere is densest near the surface of the earth, because it has to support the weight of the whole column of air above it, which, owing to its being very compressible, compels it to occupy less space. This law of decrease in pressure being known, its application is made use of in the Measurement of Mountains; for the barometer will indicate a less pressure on the summit than at the base in proportion as it is high. As an instance, let us take the measurement of a mountain:

Barometer at the base	30·00 inches.	Temperature 60°
,, ,,	summit 25·70 inches.	,, 44°

The mean of these two observations of the barometer is 27·85 inches, their difference 4·30 inches. The mean of the two observations of the thermometer is 52°.

In a table of factors constructed by Sir George Shuckburgh, the factor of 52° is 910·8 feet,

$$\therefore \quad \frac{30 \times 4{\cdot}30 \times 910{\cdot}8}{27{\cdot}85} = 4218{\cdot}9 \text{ feet.}$$

Therefore 4218·9 feet is the height of the mountain.

Thus the following rule will enable any one to measure a hill with a barometer:

Let x = height of the hill required.
A = mean height of the two barometer observations (that is, at the base, and at the summit).
a = the difference of the two barometer observations.
b = the factor in the Table corresponding to the mean of the two thermometer observations.

(Barometer at 30 inches.) Then $x = \frac{30ab}{A}$

—*E. J. Lowe, F.R.A.S., Magazine of Nat. Phil.*, pt. iii.

THE THUNDERBOLT.

A singular variety in the appearance of the flashes of lightning during a severe thunderstorm is usually designated

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a Thunderbolt by the uninformed, from its resemblance to a large and rapidly-moving ball of fire, which is erroneously supposed to fall as a solid body.

A WATCH MELTED BY LIGHTNING.

Mr. R. N. Spence, of Windhouse, in the island of Yell, relates, that about the beginning of the present century, during a violent thunderstorm off the Shetland Islands, a fishing-boat belonging to Mr. Midyell was struck by lightning, which came down the mast, tearing it in shivers, and melted into a mass a watch in the pocket of a man (the skipper) who was sitting close by the mast, and considerably scorched him, as well as materially injured the boat, and, more or less, the other five men in it. This account of the occurrence was received by Mr. Spence from the skipper himself.—*Andrew Hay, Esq., Lerwick.*

DIRECTION AND VELOCITY OF THE WINDS.

Professor Airy has found that the Wind never blows steadily for any period of time except from eight points of the compass. When in any other quarter, it is merely shifting round to one of these points. It never blows at all directly from the south! The two most prevalent winds are the S.S.W. and W.S.W.; the one of which invariably brings rain, while the other is accompanied by dry weather. Between the W. and N.W. is one point of duration; between the N. and E. another; and another between the E. and S.S.W., which, with the N., the W., and the E., make the eight points alluded to, from which the wind blows for prolonged periods.

Maltebrun states: The velocity of winds being the circumstance most palpable to our senses, several arbitrary denominations have resulted from it, the principal of which are as follow:

Gentle wind (a breeze) traverses		10 feet in a second.
Moderate . (an easy gale) . . .		16
Strong . . (a stiff gale) . . .		24
Violent . . (a squall)		35
Storm	Slight	43
	Considerable . . .	49
	Violent	54
Hurricane	Of the temperate zones	60
	Of the torrid zone .	120 to 300.—*Phys. Geogr.* i.*

WHAT ARE TRADE-WINDS?

Vast currents of air, which sweep round and round the

* Horology has enabled us to discover that when the wind passes one mile per hour, it is scarcely perceptible; while at the rate of 100 miles per hour, it acquires sufficient force to tear up trees and destroy the produce of the earth; and without the aid of a seconds clock it would have been scarcely possible to ascertain that a cannon-ball flies at the rate of 600 feet in a second.—*Adam Thomson's Time and Timekeepers*, p. 156.

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globe in huge strips of more than 12,000 miles in width; and are, in a manner, forced more or less on every one's notice, from contributing essentially to that boundless interchange of the productions of distant regions by which modern times are so agreeably distinguished from the old.—*Captain Basil Hall.*

DOES THE MOON INFLUENCE THE WEATHER?

Arago was considered to have decided this opinion to be a fallacy; but, in 1851, Mr. J. W. Alexander, in the *American Journal of Science and Arts*, stated, as the result of a long-continued series of observations, "that the third day before the new moon regulates the weather on each quarter-day of that lunation, and also characterises the general aspect of the whole period. Thus, if the new moon happened on the 26th of May 1851, the term-day was the 24th; the weather of the 24th of May was to be that of the 26th of May, and the 3d, 11th, and 19th of June, the quarter-days respectively of that lunation."—*Mechanics' Magazine.*

RAINY DAYS IN THE YEAR.

In general, the number of Rainy Days is greatest near the sea, and decreases in proportion the further we penetrate into the interior. On the eastern side of Ireland, it rains 208 days of the year; in the Netherlands on 170; in England, France, and the North of Germany, and in the Gulf of Finland, on from 152 to 155 days; on the plateau of Germany on 131; and in Poland on 158 days; while on the plains of the Volga, at Kasan, it rains on 90; and in the interior of Siberia, only on 60 days of the year. In Western Europe it rains on twice as many days as in Eastern Europe; in Ireland on three times as many days as in Italy and South of Spain.—*Johnston's Phys. Atlas.*

Our longest-continued rains usually begin on the south and west of Great Britain, and proceed northwards. This occurs when an easterly and south-west current both prevail in the atmosphere. In these cases it sometimes takes several days before the dry east wind becomes saturated with moisture, and rain begins to fall on the eastern coasts. Hence the popular idea that our greatest rains come from the east; whereas, in reality, all the deposited moisture comes with the southerly current, and the cold east wind acts merely as the condensing agent.—*W. Rhind.*

When the rain is gathering from the south or west, and those flowers and herbs which serve as natural hydrometers close their leaves, men have no occasion to consult the stars for what the clouds and the earth are telling them.—*Southey.*

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Sight and Sound.

PHENOMENA OF VISION.

It has been ascertained beyond doubt, that in perceiving the tint of the scarlet geranium our eyes are affected by undulations, recurring from 482 millions of times in a second; that before we can appreciate the tint of the yellow blossoms of the gorse or laburnum, 542 millions of millions of vibrations must have taken place; and that to discriminate the colour of the violet, not less than 707 millions of millions of movements must have been communicated to the fibrilia of our retina!—*Todd's Cyclopædia.*

CLASSIFICATION OF RAINBOW COLOURS.

In the *Philosophical Magazine* we find the subjoined Classification of the Colours of the Rainbow, given as more scientific than the common enumeration. The writer observes that he has often seen the rainbow, when very bright, repeated three or four times, every repetition being gradually fainter; each set of colours being half the width of the preceding (like the repeated notes of the musical octave on a divided string or line), and succeeding according to the following classification:

Red.	
Orange, divided into	Reddish, called Scarlet. Yellowish, called Orange.
Yellow.	
Green, divided into	Yellowish, called Pomona. Bluish.
Blue.	
Purple, divided into	Bluish, called Indigo. Reddish, called Violet.
Red.	
Orange, &c.	

COLOURED GLASS IN THE GREAT PALM-HOUSE AT KEW.

To protect the plants from the scorching heat of the sun in this vast conservatory (363 feet in length, 100 feet wide, and 63 feet high), the glass is of a very pale yellow-green colour, which is so transparent as scarcely to intercept any light, while it keeps out much of the heat. This tint of colour, which was suggested by Mr. Robert Hunt, is not very different from that

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of the old crown-glass; and many practical men state, that they find their plants flourish much better under this kind of glass than under the white sheet-glass which is commonly employed.

DISSOLVING VIEWS.

This beautiful optical combination is made by means of two magic lanterns; in one of which is the summer representation, and in the other the winter representation of the same landscape, when the one is made to pass into the other with a beauty and effect which it is impossible to describe. The same effect might be produced, though less perfectly, by mirrors; so that the ancients might have effected any metamorphosis they chose by such an apparatus; they might have thus summoned the dead man from his grave, or given to the pallid corpse both life and motion.—*North British Review*, No. V.

VELOCITY OF SOUND.

Sir John Herschel calculates, it may be stated in round numbers, that Sound, in dry air, and at the freezing temperature, travels at the rate of 1090 feet, or 363 yards, per second of time; that when the thermometer is at 62° Fahrenheit, Sound runs over 9000 feet in eight seconds, 12¾ British standard miles in a minute, or 765 miles in an hour, which is about three-fourths of the diurnal velocity of the earth's equator.

ANCIENT ACOUSTICS.

Aristotle, who was physician to Alexander the Great, invented for his master a trumpet which was capable of conveying orders to his generals at the distance of 100 stadia, equal to rather more than twelve miles. Both Alcmeon and Hippocrates are said to have invented ear-trumpets; so that the ancients do not seem to have been so ignorant of acoustics as some writers would represent them.

ECHOES EXPLAINED.

When sound is interrupted by obstacles of sufficient extent and regularity, it is reflected, and produces the phenomenon called an Echo. A wall, the side of a house; the ceiling, floor, and wall of an apartment, and an arched roof; give rise to echoes more or less audible. If the reflected sound meet with a second obstacle, it will be again reflected; and thus the echo may be repeated many times in succession, becoming fainter at each repetition, till it dies away altogether.

Pepys notes in his *Diary*, 1666: "Discoursed with Mr. Hooke about the nature of sounds, who told me, that having come to a certain number of vibrations proper to make any tone, he is able to tell how many strokes a fly makes with her wings (those flies that hum in their flying) by the note that it answers to in music during their flying. That, I

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suppose, is a little too much refined; but his discourse, in general, of sound was mighty fine."

BREAKING GLASS BY SOUNDS.—SYMPATHY OF VIBRATIONS.

It is owing to the sympathetic communication of vibrations that persons with clear and powerful voices have been able to break a large tumbler-glass by singing close to its proper fundamental note. We have heard of a case where a person broke no fewer than twelve large glasses in succession. The sympathy of vibrations, or tendency of one vibrating body to throw another into the same state of vibration, shows itself remarkably in the case of the going of two clocks fixed to the same shelf or wall. It was known, near a century ago, that two clocks set going on the same shelf will affect each other. The pendulum of the clock which is stopped, after a certain time, will resume its vibrations, and in its turn stop that of the other clock. Mr. John Elliot, who first observed these effects, noticed that two clocks, which varied from each other ninety-six seconds a day, agreed to a second for several days when they were placed on the same rail. The slowest of these two clocks, which had a slower pendulum, set the other in motion in sixteen minutes and a half, and stopped itself in thirty-six minutes and a half. These effects are clearly produced by the small vibrations communicated from the one pendulum to the other through the shelf, or rail, or plank, on which they both rest. It has been found that two conflicting sounds produce silence, as two converging rays of light produce darkness.—*Sir John Herschel.*

Aubrey, in his *Natural History of Wiltshire*, records: "Mersennus, or Kircher, sayes, that any one may know what quantity of liquor is in the vessel by the sound of it, knowing before the empty note. I have severall times heard great brasse pannes ring by the barking of a hound; and also by the loud voice of a strong man. The voice, if very strong and sharp, will crack a drinking-glass."—*J. Evelyn.* Upon this Mr. Britton notes, that Mr. Brayley was once present at a party on Ludgate Hill, London, when Mr. Broadhurst, the well-known tenor, by singing a high note, caused a wine-glass on the table to break, the bowl being separated from the stem.

MUSIC OF THE FLUTE.

That it is really the air which is the sounding body in a flute or other wind instrument, appears from the fact, that the materials, thickness, or other peculiarities of the pipe, are of no consequence. A pipe of paper, and one of lead, glass, or wood, provided the dimensions be the same, will produce, under similar circumstances, exactly the same tone as to *pitch*. If the *qualities* of the tones produced by different pipes differ, this is to be attributed to the friction of the air within them, setting in feeble vibration their own proper materials.—*Sir John Herschel.*

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MUSIC OF THE CELESTIAL SPHERES.

The idea of a Celestial Music, engendered by the movements of the heavenly bodies, was very much diffused among the ancients; it is even found in the works of modern poets—as, for example, in the following verses of Rousseau:

"Quel plus sublime cantique
Que se consort magnifique
De tous les célestes cordes!
Quelle grandeur infinie,
Quelle divine harmonie,
Résulte de leurs accords!"

Arago's Popular Astronomy, vol. i.

WHAT IS VENTRILOQUISM?

It is now pretty generally admitted that Ventriloquism simply consists in a slow and gradual expiration, preceded by a strong and deep inspiration, by which a considerable quantity of air is introduced into the lungs, which is afterwards acted upon by the flexible powers of the larynx and the trachea. Any person, therefore, by practice, can obtain more or less expertness in this exercise; in which, although not apparently, the voice is still modified by the mouth and the tongue. M. Lespagnot has demonstrated that ventriloquists have acquired by practice the power of exercising the veil of the palate in such a manner that, by raising or depressing it, they dilate or contract the inner nostrils. If they are closely contracted, the sound produced is weak, dull, and seems to be more or less distant; if, on the contrary, these cavities are widely dilated, the sound is strengthened by these tortuous infractuosities, and the voice becomes loud, sonorous, and apparently close to us. Thus, any able mimic, who can with facility disguise his voice, with the aid of this power of modifying sounds, may in time become a ventriloquist.—*Dr. Milligen.* What reference the term ventriloquism (literally, speaking from the belly) can possibly bear to a faculty whereby the whole mystery is performed by the muscles of the throat—we have yet to learn.

NOISE IN SHELLS.

There are few of us who do not remember the childish wonder we once felt at hearing the resonance produced by placing a sea-shell to the ear,—an effect which fancy has likened to "the roar of the sea." This is caused by the hollow form of the shell and its polished surface, enabling it to receive and return the beatings of all sounds that chance to be trembling in the air around the shell.

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HINTS FOR PUBLIC SPEAKERS.

In a large room, nearly square, the best place to speak from is near one corner, with the voice directed diagonally to the opposite corner. In all rooms of common forms, the lowest pitch of voice that will reach across the room will be most audible. In all such rooms, it is better to speak along the length of the room than across it; and a low ceiling will, *cæteris paribus*, convey the sound better than a high one. It is better, generally, to speak from pretty near a wall or pillar, than far away from it. It is desirable that the speaker should speak in the key-note of the room, and evenly, but not loud.

In every case, the separation of the wall-surface into small receptacles, like the private boxes of a theatre, the recesses of a library, or the side-chapels of a Gothic cathedral, is favourable to distinct hearing.—*John Scott Russell, F.R.S.*

FATAL EFFECT OF SOUND.

Great sounds or violent concussions of the air, such as those produced by large cannon or loud thunder, produce ordinarily most astounding, and, in some instances, overwhelming effects on men and animals. Brewster relates, that when Peace was proclaimed in London in 1697, two troops of horse were dismounted and drawn up in line, in order to fire their volleys. Opposite the centre of the line was the door of a butcher's shop, where there was a mastiff dog of great courage. This dog was sleeping by the fire; but when the first volley was fired, it immediately started up, ran into another room, and hid itself below the bed. On the firing of the second volley the dog rose, ran several times about the room trembling violently, and apparently in great agony. When the third volley was fired, the dog ran about once or twice with great violence, and instantly fell down dead, throwing up blood from its mouth and nose.

TO TELL THE DISTANCES OF SHIPS AT SEA.

If a gun be fired by a vessel at sea, the distance may be known by observing the number of seconds which elapse between the flash and the report. In mild weather sound travels at the rate of 1123 feet in a second: if, therefore, the report of the gun were heard five seconds after the flash had been seen, the distance of the observer from the gun would be 5615 feet, or rather more than a mile. This is merely an approximation, for the velocity of sound varies according to the density of the atmosphere. In dry frosty weather sound travels at the rate of only 1080 feet in a second.—*Adam Thomson's Time and Timekeepers*, p. 168.

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Geographical Discovery.

COLUMBUS NOT THE FIRST DISCOVERER OF AMERICA.

Baron Humboldt rightly assigns an earlier date than that of Columbus to the actual Discovery of the American continent. Rejecting as exploded the tale of tribes speaking in a Celtic dialect having been found on the coast of Virginia, we are bound by very sufficient proofs to admit that the coasts of Labrador and New England were known to the Icelanders and Norwegians, through their intervening settlements, more than eight centuries ago; that they partially settled in Vinland, as they called the country forming the New England States; and that a bishop went on a Christian mission to the colonies thus established. These narratives, hitherto known and accredited by a few only, have of late years received ample confirmation from the researches of Rafn, the greatest northern scholar of our times. The documents which he obtained, and has published, attest not only the act of discovery, but indicate, by the course and length of voyage, by the times of sunrise, and other curious particulars, the exact coasts discovered, including Newfoundland, Nova Scotia, and Massachusetts, &c. Humboldt speaks of Lief as the discoverer of America; and perhaps he may be so regarded from the extent of his southern course; though we find reason to believe that Labrador had already been visited in A.D. 1001 by Biom Heriolfson, an Icelandic navigator. The records of this event, both numerous and authentic, come to us from that extraordinary island of Iceland, which, during the eleventh, twelfth, and thirteenth centuries, created and maintained, amidst its snows and volcanic fires, a literature which would have honoured the happiest climes of Europe. Succeeding the period thus signalised to us, a series of physical and social calamities extinguished this great northern light; at which latter time, and in the same storm, we lose sight of the land of Vinland, and all traces of this remarkable discovery disappear. Should we ever regain them, it must probably be on the American coast itself. But the simple Norsemen left behind them no temples or palaces, like those of Nimrod, to be disentombed for the admiration and instruction of distant ages, and the written records alone remain to attest this ancient discovery.—*Quarterly Review*, No. 86.

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CANADA.

Sir John Barrow derives this name as follows. When the Portuguese, under Gaspar Cortereal, in 1590, first ascended the great river St. Lawrence, they believed it was the strait of which they were in search, and through which a passage might be discovered into the Indian Sea. But on arriving at the point whence they could clearly ascertain it was not a strait but a river, they, with all the emphasis of disappointed hopes, exclaimed repeatedly, "Canada!" (Here nothing),—words which were remembered and repeated by the natives on seeing Europeans arrive in 1534, who naturally conjectured that the word they heard employed so often must denote the name of the country.

NIAGARA.

The Fall of Niagara is an instance of the power running water may exercise in altering the features of a country. It is calculated that, by the sap and fall of the hard limestone-rock, over which the river is precipitated into a softer shell-formation beneath, the cataract retrogrades towards Lake Erie at the rate of 50 yards in 40 years. The distance already travelled by it, from the lower opening of the narrow gorge it has evidently cut by this process, is about 7 miles; and the remaining distance to be performed, before it reaches Lake Erie, is about twenty-five. Had the limestone platform been less extensive, this enormous basin might have been already drained, as it ultimately must be, when the fall has receded to its margin, its average depth being far less than the height of the cataract. —*Quarterly Review*, No. 86.

The proper name of the Falls is *Niágara* or *aghera*, two Indian words, signifying, "Hark to the thunder."*

WHO FIRST DOUBLED THE CAPE OF GOOD HOPE?

In this enlightened age, the reply of every schoolboy to this query will be, "Why, Vasco de Gama, to be sure." In Portugal, however, a much more ancient navigator has been mentioned. Vieyra, an old preacher of great renown at Lisbon, said, in one of his sermons: "One man only passed the Cape of Good Hope before the Portuguese. And who was he? and how? It was Jonas in the whale's belly! The whale went out of the Mediterranean, because he had no other course; he kept the coast of Africa on the left, scoured along Ethiopia, passed by Arabia,

* A railway suspension-bridge, of 822 feet span, has been built across the Niagara River, below the falls, at the height of 250 feet above the water. It hangs by four cables, each containing 3640 wires, and estimated to be altogether a weight of 7000 tons; it has two platforms, the lower one being for horses and vehicles.

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took port in the Euphrates on the shores of Nineveh, and, making his tongue serve as a plank, landed the prophet there." Upon this, Southey drily remarks, that "the sermons of Vieyra, perhaps more than any other compositions in any language, display the strength and the weakness of the human mind."

"CREOLE" AND "MULATTO."

Creole is a French form of the Spanish *criollo*, which, in the dictionary of Nuñez de Taboado is defined, "El hijo de padres Europeos nacido en America;" whilst in the old dictionary of Stevens (1726), it is translated, "son of a Spaniard and a West-India woman." The word is often, in England, understood to imply a Mulatto; but it strictly means a native of a West-India colony, whether white, black, or of the coloured population. Webster, however, defines it as "a native of Spanish America or the West Indies, descended from European parents;" and Mulatto, as "the offspring of a negress by a white man, or of a white woman by a negro."

ENGLAND THE CENTRE OF THE TERRESTRIAL HEMISPHERE.

If we divide the globe into two hemispheres, according to the maximum extent of land and water in each, we arrive at the curious result of designating England as the centre of the former, or terrene half; an antipodal point, near New Zealand, being the centre of the aqueous hemisphere. The exact position in England is not far from the Land's End; so that if the observer were there raised to such a height as to discern at once the half of the globe, he would see the greatest possible extent of land; if similarly elevated in New Zealand, the greatest possible surface of water.—*Quarterly Review*, 1849.

THE PORT OF LONDON.

Sir John Herschel was, we believe, the first to point out a fact which may perhaps afford a key to the surpassing prosperity of the British metropolis, namely, that "*the situation of London is nearly in the centre of the (most civilised) terrestrial hemisphere.*"

BENEFITS FROM THE ARABS.

The Arabs have effected, although in a rude way, far more than the Greeks and Romans towards making the eastern and western worlds acquainted with each other, and communicating arts and knowledge. These (until inspired by the fanaticism of a new religion) housekeeping barbarians pushed their religion, arms, arts, and trade, within thirty years to the western

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confines of India, and in eighty-eight years to Spain. They pushed their commerce to China and the remotest islands of the Indian Ocean,—which neither Greek nor Roman had ever reached. We owe to their fanaticism cotton, coffee, the sugar-cane and culture of sugar, paper, arithmetical notation, race-horses, the whole citron or orange tribe of fruits, and all the various products of distillation.—*Mr. Crawfurd; Proceedings of the British Association.*

GEOGRAPHICAL DISCOVERIES OF A QUARTER OF A CENTURY.

Within the last twenty-five years all the principal features of the geography of our own vast interior regions have been accurately determined: the great fields of Central Asia have been traversed in various directions from Bokhara and the Oxus to the Chinese Wall; the half-known river-systems of South America have been explored and surveyed; the icy continent around the Southern Pole has been discovered; the North-Western Passage, the ignis-fatuus of nearly two centuries, is at last found; the Dead Sea is stripped of its fabulous terrors; the course of the Niger is no longer a myth, and the sublime secret of the Nile is almost wrested from its keeping. The Mountains of the Moon, sought for through 2000 years, have been beheld by a Caucasian eye; an English steamer has ascended the Chadda to the frontiers of the great kingdom of Bornou; Leichardt and Stuart have penetrated the wilderness of Australia; the Russians have descended from Irkoutsk to the mouth of the Amoor; the antiquated walls of Chinese prejudice have been cracked and are fast tumbling down; and the canvas screens which surround Japan have been cut by the sharp edge of American enterprise. Such are the principal results of modern exploration. What quarter of a century, since the form of the earth and the boundaries of its land and water were known, can exhibit such a list of achievements?—*New York Tribune.*

NAMES OF COUNTRIES.

It is a good rule to refer the Names of Countries to their actual physical aspects. "Are not the terms Edom and the Red Sea to be referred to the red sandy soil? Would Albion ever have gained the name if it had not been for her white cliffs? Was Greenland not the glad welcome given by the hardy Icelanders to that green oasis? And is not the White Sea so called from its proximity to the regions of ice and snow?" —*Notes and Queries*, No. 290.

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INFLUENCE OF THE CRUSADES.

On almost every interest of man these most singular events have indented their history. The gallantry of the far later conflicts on the strand of Acre is forgotten in the feats of Cœur de Lion in this cause. Cyprus, Rhodes, Malta, are still most famed for the military orders which arose out of them, and which have left in those islands the trophies and insignia of their renown. Zante still sends forth its Cape Klarenza, which, remembered by the voyagers to Syria as their steering-point, has ever since the time of Edward the Third given a ducal title to our royal family. The story is told by the cross-hilted sword, and the recumbent figures of our monumental effigies. The signs of our common hostelries still show the formidable heads of Saracen and Turk; where many a woodland glade opens into its vistas, where many a noble hall yet stands, where many an ancient lineage gives name and title, we are reminded of the Templar, his cœnobitic house and judicial preceptory. The cross nailed on the humble tenement in some of our towns, proclaims the exemption from socage which these imperious knights demanded for themselves and their attendants. The very corruption of some words proves how radicated were the institutions which this warfare raised and shaped.—*North British Review*, No. 1.

EARLY DISCOVERIES WITH THE COMPASS.

In the development of the commercial spirit of the Crusades, Providence is seen in its most manifest footsteps. Sitting upon the floods, it opens to new enterprises. The Compass twinkling on its card was a beam from heaven; that tiny magnet was given as the seniory of earth and sky. Like a new revelation, the mysteries of an unknown world were unveiled; like a new illapse, the bold and noble were inspired to lead the way. Dias doubles the Cape of storms; De Gama finds his course to the East Indies; Columbus treads the Bahamas;—and twelve years do not separate these discoveries.—*North British Review*, No. 1.

THE UNITED STATES AND CANADA BOUNDARY-LINE.

This Line, run in accordance with the Ashburton Treaty, cost the labour of 300 men eighteen months. For 300 miles a path was cut through the forest, 30 feet wide, and cleared of all trees. At the end of every mile is a cast-iron pillar, painted white; square, four feet out of the ground; and bearing, in raised letters on its sides, the names of the Commissioners who ran the line; and the date.—*Montreal Morning Courier.*

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Life and Death.

CREATION OF MAN.

THE enlightened and pious philosophy of the present day recognises as a fact, on the authority of revelation, that the human species came upon this planet solely in virtue of a direct act of creation by the Almighty. *God created man in his own image—in the image of God created he him. And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul.* "He did not merely possess it," observes Coleridge; "he *became* it. It was his proper being; his truest self; the man in the man. All organised beings have life in common, each after its kind. This, therefore, all animals possess, and man as an animal. But in addition to this, God transferred into man a higher gift, and specially imbreathed even a living—that is, self-subsisting—soul; a soul having its life in itself."—*Aids to Reflection, Introd. Aphorisms*, IX.

OUR FIRST PARENTS.

"We think," says a masterly writer in the *Quarterly Review*, "there are sufficient grounds, without reference to the sacred writings, for arriving at the conclusion that all races and diversities of mankind are really derived from a single pair; placed on the earth for the purpose of peopling its surface, in both the lives before us, and during the ages which it may please the Creator yet to assign to the present order of existence here."

MAN'S EXISTENCE ON THE EARTH.

None of the researches of geology in any part of the globe have succeeded in bringing to light one single fragment of the fossilised frame of man in any undisturbed geological formation, by which is meant those portions of the earth's crust to which, though the most recent formations in geology, geologists assign a higher antiquity than any reached by history. It is true, that a solitary specimen of a petrified skeleton, found in the island of Guadaloupe, is to be seen in the British Museum, and which, on account of certain peculiarities in the pelvis, is regarded as having been the skeleton of a negro. If this be so, its date

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must be, of course, subsequent to the discovery of Guadaloupe by Europeans, A.D. 1493. It is not, in other words, the skeleton of one of the Caribs, the original inhabitants; and cannot be more than between two and three hundred years old.

Thus, then, the new and brilliant science of geology attests that *man was the last of created beings in this planet.* If her *data* be consistent and true, and worthy of scientific consideration, she affords conclusive evidence that, as we are told in Scripture, he cannot have occupied the earth longer than *six thousand years.* *Hitchcock's Religion of Geology*, p. 157.—*S. Warren, D.C.L.*

CIRCULATION OF THE BLOOD.

Harvey's discovery cost him twenty-six years to bring it to maturity; for it was ill received, most persons opposed it, others said it was old, and very few agreed with him. Yet Harvey had his admirers; and one of his panegyrists has apostrophised him thus:

> "With Drake and Ca'endish hence thy bays are curl'd,
> Fam'd circulator of the lesser world."

But the epithet circulator, in its Latin invidious signification *quack*, was now applied to Harvey in derision, and his researches and discoveries were treated by his adversaries with contempt. Yet he ultimately enjoyed fame; his system was received in all the universities of the world; and Hobbes has observed, that Harvey was the only man, perhaps, who ever lived to see his own doctrine established in his lifetime.

VESALIUS AND ANATOMY.

Every early anatomist was left far behind by Vesalius, who published at Basle, in 1543, his great work, *De Corporis Humani Fabrica.* The love of science seems to have engaged him and his fellow-students in strange scenes of adventure. "Those services," says Mr. Hallam, "which have since been thrown on the refuse of mankind, they voluntarily undertook:

> 'Entire affection scorneth nicer hands.'

They prowled by night in charnel-houses, they dug up the dead from the grave, and climbed the gibbet, in fear and silence, to steal the mouldering carcass of the murderer." The fate of Vesalius himself was lamentable: "Being absurdly accused of having dissected a Spanish gentleman before he was dead, he escaped capital punishment at the instance of the Inquisition only by undertaking a pilgrimage to Jerusalem, during which he was shipwrecked, and died of famine in one of the Greek islands."

IDENTITY OF ORGANISED BEINGS.

The capacity of an organised being to be perpetuated by

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the construction of other organised beings is truly wonderful; for the essential peculiarities are transmitted for thousands and thousands of years. When we inspect the remains of Egyptian antiquity in the British Museum, we are struck with the similarity of the various animals which are represented in the drawings, or which are preserved by the process of embalming. Cuvier observes: "I have carefully examined the figures of animals and birds engraven on the numerous obelisks brought from Egypt to ancient Rome. In the general character, which is all that can have been preserved, these representations perfectly resemble the originals, as we now see them. M. Geoffrey St. Hilaire collected numerous mummies and skeletons of the present day." Lawrence, in his valuable work on Man, observes, that animals are just the same now as at any, even the remotest, period of our acquaintance with them. The zoological descriptions of Aristotle, composed twenty-two centuries ago, apply in all points to the individuals of the present time; and every incidental mention of animals, or allusion to their characters and properties, in the writings of historians, poets, and fabulists, confirms their identity of form and endowments. —*On Instinct and Reason, by Alfred Smee, F.R.S.*

THE FACIAL LINE.

The application of the Facial Line, instituted by Camper, is most minutely explained in his posthumous work, "On the Natural Differences of the Features, &c." Like Daubenton, he draws on the profile of the cranium two straight lines, which intersect each other, but in different directions from those of the French anatomist. A horizontal line passes through the external auditory passage and the bottom of the cavity of the nose; this is intersected by a more *perpendicular* one, proceeding from the convexity of the forehead to the most prominent point of the upper jaw, or of the intermaxillary bone. The latter is the proper *facial* line; and the angle which it forms with the horizontal line determines, according to Camper, the differences of the crania of animals, as well as the national physiognomy of the various races of mankind.

FAMILY LIKENESSES.

Southey, in a letter to Sir Egerton Brydges, says: "Did you ever observe how remarkably old age brings out family likenesses,—which, having been kept, as it were, in abeyance while the passions and business of the world engrossed the parties, come forth again in age (as in infancy), the features settling into their primary characters before dissolution? I have seen some affecting instances of this; a brother and sister, than

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whom no two persons in middle life could have been more unlike in countenance or in character, becoming like as twins at last. I now see my father's lineaments in the looking-glass, where they never used to appear."

WHAT ARE "INNATE IDEAS"?

Innate ideas signify those notions or impressions supposed to have been stamped upon the mind from the first instant of its existence, as contradistinguished from those which it afterwards gradually acquires from without. Locke undertook to demonstrate that ideas are not innate; and the dispute has the greatest names arrayed on each side. Bishop Law, the patron of Dr. Paley, and a zealous partisan of Locke, remarks: "It will really come to the same thing with regard to the usual attributes of God, and the nature of virtue and vice, whether the Deity has *implanted* these instincts and affections in us, or has framed and disposed us in such a manner—has given us such power and placed us in such circumstances—that we must *necessarily acquire* them."

BLANKS IN EXISTENCE.

"Memory," says Mr. A. Smee, in his work on *Instinct and Reason*, just quoted, "depends upon organisation, and the state of the organ in which it is manifested. A person under the influence of chloroform, ether, or spirituous liquors, remembers nothing which has occurred; hence the two former fluids are frequently used during the performance of surgical operations. A leg may now be removed, a new nose made, or any tedious operation may be performed, without the patient being in the least degree cognisant of the process. Surgeons now constantly employ these remedies. When chloroform is used in sufficient quantity, it induces a state of perfect insensibility. During this state the surgeon performs the operation; and the patient neither winces nor shows the slightest sign of pain, but remains with a placid countenance, as though he were thrown into a gentle sleep. After a short time he suddenly wakes up, rubs his eyes, and stares around him. The interval is a blank in his existence. When all is over, I have frequently heard the patient ask when the surgeon will begin; and he is delighted when he is told that the whole has been completed without his knowledge. The memory of the event is lost from the action of the ether or chloroform on the blood preventing it from acting properly on the brain."

MAGNETISM AND MIND.

"Mesmer," says Tennemann in his *Manual of the History of Philosophy*, "discovered, or rather re-discovered, the existence

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of a new force—a universally diffused power similar to attraction and electricity, permeating and acting on all organised and unorganised bodies." Some view it simply as "a nervous fluid;" while others resolve certain alleged phenomena of natural and artificial somnambulism to "the power of the mind acting directly on the organisation;" whence the "two new sciences, Neuro-Hypnology and Electro-Biology." Professor Eschenmayer admits the existence of "an organic ether," spread every where, and subtler than light; and with this view "connects his mystical and spiritual metaphysics." Dr. Passavant "shows the instincts and important relation between the sciences and the sublimest sentiments of *religion!*" What will be said of these things a few centuries hence? Shall we be laughed at for laughing at them—if our age *do* laugh at them? or does a discriminating philosophy detect in action, amidst a mass of absurdity and even fraud, startling indications of physical truth?—*S. Warren, D.C.L.*

RESPIRATION OF GREAT BRITAIN.

From observations and experiments by Mr. Coathupe and others, the following details may be relied on: 460,800 cubic inches, or 266·66 cubic feet of air pass through the lungs of a healthy adult of ordinary stature in twenty-four hours, of which 10·666 cubic feet will be converted into carbonic acid gas=2386·27 grains, or 5·45 ounces (avoirdupois) of carbon. This gives 96·6 grains of carbon per hour produced by the respiration of one human adult, or 124,328 pounds annually; and if we multiply this by 26½ millions (being the calculated population of Great Britain and Ireland in the year 1839), we have 147,070 tons of carbon as the annual product of the respiration of human beings then existing within the circumscribed boundaries of Great Britain and Ireland.—*Philosophical Magazine.*

RESPIRATION OF MAN.

The atmosphere covers the surface of the earth, as an ocean, about fifty miles deep. A man's chest contains nearly two hundred cubic inches of air; but in ordinary breathing he takes in at one time, and sends out again, about twenty cubic inches—the bulk of a full-sized orange;—and he makes about fifteen inspirations in a minute. He vitiates, therefore, in a minute about the sixth part of a cubic foot; but which, mixing as it escapes with many times as much of the air around, renders unfit for respiration three or four cubic feet. The removal of this impure air, and the supply in its stead of fresh air, is accomplished thus: the air which issues from the chest, being heated to near the temperature of the living body, namely 98°, and being thereby dilated, is lighter, bulk for bulk, than

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the surrounding air at any ordinary temperature; it therefore rises in the atmosphere, to be diffused there, as oil set free under water rises; in both cases a heavier fluid is, in fact, pushing up and taking the place of a lighter. In aid of this process come the greater motions in the atmosphere called winds, which mingle the whole, and favour agencies which maintain the general purity.—*Dr. Neil Arnott.*

WE BREATHE THAT WE MAY LIVE.

During respiration we draw into our lungs atmospheric air containing a very minute proportion of carbonic acid gas—two gallons in 5000 gallons of air. But when we return the air to the atmosphere from our lungs, it contains a much larger proportion of this gas. It is constantly produced in the blood, and given off from the surface of the lungs into the air. A full-grown man throws off as much carbonic acid every day as contains eight or ten ounces of carbon; a cow or a horse about five times as much. This carbon the animal derives in great part from the starch or sugar which it eats; and thus the purpose or function of all the parts of the blood is explained. The gluten repairs the waste of the muscles, the oil lays on fat, the saline matters yield their necessary ingredients to the bones and the blood, and the starch feeds the respiration.—*North British Review*, No. 6.

"WE DIE DAILY."

The bodies of animals are continually undergoing a series of invisible changes of substance, of which they are entirely unconscious. We look at our hand to-day, as we write, and we fancy it is the same substance as it was yesterday, or last year—as it was ten years ago. The form of each finger, of each nail, is the same. Scars made in our infancy are still there. Nothing is altered or obliterated; and yet it is not the same hand. It has been renewed over and over again since the days of our youth. The skin, and flesh, and bone, have been frequently removed and replaced. And so it is, more or less, with our whole body. The arms and limbs that sustained us in our schoolboy struggles are long since consigned to the dust, have perhaps lived over again more than once in plant, or flower, or animal. *In from three to five years the entire body is taken out and built in again with new materials.* A continued activity prevails among the living agencies to which this hidden work is committed. Every day a small part is carried away; just as if a single brick were every day taken out of an old wall, or a single wheel out of a watch, and its place supplied by another. The body therefore requires constant supplies, at every period of its life, of all those things of which its several parts are built up.—*North British Review*, No. 6.

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PHENOMENA OF THE DEATH-BED.

Whatever be the causes of dissolution, whether sudden violence or lingering malady, the immediate modes by which death is brought about appear to be but two. In the one, the nervous system is primarily attacked, and there is a sinking, sometimes an instantaneous extinction, of the powers of life; in the other dissolution is effected by the circulation of black venous blood instead of the red arterial blood. The former is termed death by syncope, or fainting: the latter, death by asphyxia. In the last-mentioned manner of death, when it is the result of disease, the struggle is long, protracted, and accompanied by all the visible marks of agony which the imagination associates with the closing scene of life,—the pinched and pallid features, the cold clammy skin, the upturned eye, and the heaving, laborious, rattling respiration. Death does not strike all the organs of the body at the same time: some may be said to survive others; and the lungs are the last to give up the performance of their function, and die. As death approaches, they become gradually more and more oppressed; the air-cells are loaded with an increased quantity of the fluid which naturally lubricates their surfaces; the atmosphere can now no longer come into contact with the minute blood-vessels spread over the air-cells, without first permeating this viscous fluid,—hence the rattle; nor is the contact sufficiently perfect to change the black venous into the red arterial blood: an unprepared fluid consequently issues from the lungs into the heart, and is thence transmitted to every other organ of the body. The brain receives it, and its energies appear to be lulled thereby into sleep,—generally tranquil sleep,—filled with dreams which impel the dying lip to murmur out the names of friends, and the occupations and recollections of past life: the peasant "babbles o' green fields;" and Napoleon expires amid visions of battle, uttering with his last breath "*tête d'armée.*"—*Sir Henry Halford.*

Dr. Baillie once said, that "all his observation of death-beds inclined him to believe that nature intended that we should go out of the world as unconscious as we came into it." "In all my experience," he added, "I have not seen one instance in fifty to the contrary." Yet even in such a large experience the occurrence of "one instance in fifty to the contrary" would invalidate the assumption that such was the law of nature (or "nature's intention," which, if it means any thing, means the same). The moment in which the spirit meets death is perhaps like the moment in which it is embraced by sleep. It never, I suppose, happened to any one to be conscious of the immediate transition from the waking to the sleeping state.—*Mrs. Jameson.*

Dr. Cullen, when dying, is said to have faintly intimated to a friend, "I wish I had the power of writing or speaking, for then I would describe to you how pleasant a thing it is to die." Dr. Black, worn out

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by age and a disposition to pulmonary hemorrhage, which obliged him to live very low, whilst eating his customary meal of bread and milk fell asleep, and died in so tranquil a manner, that he had not even spilt the contents of the spoon which he held in his hand. And Sir Charles Blagden, whilst at a social meal with his friends, Mons. and Mad. Berthollet and Gay-Lussac, died in his chair so quietly, that not a drop of the coffee in the cup which he held in his hand was spilled.—*Sir Humphry Davy.*

DEATH FROM OLD AGE.

A very large number of Deaths is attributed to age and debility; yet few even of the oldest die purely from exhaustion or gradual decay; some positive disease usually comes on, and overwhelms the small remains of vitality. Yet this event, though rare, is by no means impossible. Such a death is what the poets called a sleep; or, as Dr. Wilson Philip describes it: "In the only death which can strictly be called natural, the state of the sensitive system which immediately precedes death differs from its state in sleep in no respect but in degree." At what age may this be expected? We give as our answer the axiom of the Hebrew poet: "The days of our age are threescore years and ten; and though men be so strong that they come to fourscore years, yet is their strength then but labour and sorrow; so soon passeth it away, and we are gone." (*Psalm* xc.) In this part of the world we may add five or six to the fourscore years, the wear and tear of life being smaller in these temperate climates than under the glowing sun of Palestine; and accordingly we find Blumenbach, in his *Physiology*, fixing on eighty-six as the limit of human life. On looking over European bills of mortality, he found, he says, that a considerable number attained this age; but few indeed went beyond it.

DIVISIONS OF MAN'S LIFE BY THE ANCIENTS.

Seven, which numbered the notes of music, the metals, and the planets, for the Greek philosophers, was supposed by them to measure the critical intervals of human life. The "seven ages" of Hippocrates,—which, according to one account, terminated at the years seven, fourteen, twenty-eight, thirty-five, forty-two, fifty-six, seventy, or more,—were extended by Solon to the ten equal septennaries ending in the years seven, fourteen, twenty-one, twenty-eight, thirty-five, forty-two, forty-nine, fifty-six, sixty-three, seventy, or the last to which life extended; and another philosopher added the two periods up to eighty-four years, the fulness of life—beyond which he would no more reckon than would the charioteer the ground that he ran beyond the goal. Some of these septennary years coincide with striking epochs of life, and have evidently

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suggested our legal and some of our popular divisions. Varro divided life very naturally into five equal ages, terminating at the close of the years fifteen, thirty, forty-five, sixty, seventy-five, or more, and proposed to call males at the five respective ages—*pueri, adolescentes, juvenes, seniores, senes.*—*The Registrar-General's Report on the Census of* 1851.

DOUBTFUL LONGEVITY.

What is the oldest age that is now attained? What is the measure of the complete orbit of human life? The Census of 1851 furnishes some aid towards the prosecution of this inquiry. In Great Britain more than half a million of the inhabitants (596,030) have passed the barrier of "threescore years and ten;" more than a hundred and twenty-nine thousand have passed the Psalmist's limit of "fourscore years;" and 100,000 the years which the last of Plato's climacteric square numbers expressed (9 times 9=81); nearly ten thousand (9847) have lived 90 years or more; a band of 2038 aged pilgrims have been wandering ninety-five years and more on the unended journey; and 319 say that they have witnessed more than a hundred revolutions of the seasons.

Many instances are cited of men living in the ancient world more than a hundred years; and Lord Bacon, in his *History of Life and Death*, quotes as a fact unquestioned that a few years before he wrote a morris dance was performed in Herefordshire, at the May games, by eight men, whose ages in the aggregate amounted to eight hundred years. No populous village in England was then without a man or woman of fourscore years old. In the seventeenth century, some time after Bacon wrote, two Englishmen are reported to have died at ages greater than almost any of those which have been attained in other nations. According to statements which are printed in the *Philosophical Transactions* of the Royal Society, Thomas Parr lived 152 years and 9 months; Henry Jenkins 169 years. The testimony in these extraordinary instances is, however, by no means conclusive, as it evidently rests chiefly on uncertain tradition and on the very fallible memories of illiterate old men; for there is no mention of documentary evidence in Parr's case, and the births date back to a period (1538) before the parish registers were instituted by Cromwell.

At the last Census, 111 men and 208 women were returned of ages ranging from 100 to 119 years; and to the scientific inquirer in the districts where these old people reside, an opportunity is afforded of investigating and setting at rest a problem of much greater interest than some of the curious questions that engage the attention of learned societies. Two-thirds of the centenarians are women. Several of them in

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England are natives of parishes in Ireland or Scotland where no efficient system of registration exists; few of them reside in the parishes where they were born and have been known from youth; many of the old people are paupers, and probably illiterate; so that it would no doubt be difficult to obtain the documentary evidence which can alone be accepted as conclusive proof of such extraordinary ages.—*The Registrar-General's Report on the Census of* 1851.

It is strange to reflect upon a few of the great events that have occurred during the lengthened span of a Centenarian. Thus, a journalist, in recording the death of one John M'Innes, at Strontulla, near Oban, in the parish of Kilmore, at the age of 105 years, remarks: "At the time of his birth the wounds of Culloden were still unhealed, and the half of the Highlands looked on George II. as a usurper. M'Innes was a stout lad when Wolfe fell on the heights of Abraham; he was in his prime while the United States of America were still English colonies; and he was comparatively an old man before Napoleon Bonaparte was heard of. Steam navigation was only introduced after he had completed his 65th year.

LONGEVITY IN THE UNITED STATES OF AMERICA.

Dr. Fitch, in his well-known treatise on *Consumption*, relates the following instances: In 1820, a man named Henry Francisco died at Whitehall, in the state of New York, aged 134 years: he beat the drum at the coronation of Queen Anne, and was then 16 years of age; he did not die of old age, but of the ague and fever. John Hightower, residing in Marengo county, Alabama, died January 1845, aged 136 years. William Prigden, of Maryland, died October 1845, aged 123 years. The Rev. Mr. Harvey, a Baptist minister, residing at Frankfort, in the state of New York, is now in the active and useful discharge of his clerical duties, at the age of 111 years. A Mr. Blakewell, residing near Greenville, North Carolina, was living a short time since, at the age of 136 years. A coloured man named Syphax, in fine vigorous health, was living last year in Cumberland county, Virginia, at the age of 117 years. The *Montreal Times*, October 1846, translates the following from the *Revue Canadienne*: "An old man died at Wexford, Upper Canada, a short time since, named Daniel Atkin, but rejoiced in the *sobriquet* of Black Dan. At the time of his decease he was 120 years of age; and during his life had contracted seven marriages, by which he had an incredible number of children, grand-children, and great grand-children, in all about 570; 370 of whom are boys, and 200 girls." Mr. John Van Hoozer, of Jefferson county, Tennessee, died at his residence, about the 1st of August 1850, aged 122 years.

In a journal of 1854 we find the following: On October 15, Judy, a slave, died on the plantation of Edmund B. Richardson,

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in Bladen county, North Carolina, aged 110 years. She was one of eight slaves who, nearly sixty years ago, were the first settlers on the plantation where she died. Of the seven others, one died over 90 years of age, another 93, and a third 81; two are living, one 75, and the other over 60 years of age. Within five miles of the place where Judy died, William Pridgen lived, who died about five years ago, aged 122 years. David Kennison, a soldier of the Revolution, died near Albany (N. Y.) on the 24th of February 1852, aged 117 years.

DEATHS BY WAR AND PESTILENCE.

In 1855 there were issued by the Board of Health some tables showing the comparative loss of life by War and by Pestilence. It appears that in 22 years of war there were 19,796 killed, and 79,709 wounded; giving an annual average of 899 killed, and 3,623 wounded. In 1848-49 there were no fewer than 72,180 persons killed by cholera and diarrhœa in England and Wales, and 144,360 attacked; 34,397 of the killed were able-bodied persons capable of getting their own living! Besides these deaths from the great epidemic, 115,000 die annually, on an average, of preventible diseases; while 11,419 die by violence. Comparing the killed in nine great battles, including Waterloo (4740), with the number killed by cholera in London in 1848-49 (14,139), we find a difference of 9399 in favour of war. In cholera visitations, 12 per cent, sometimes 20 per cent, of the medical men employed, died. The London missionaries die as fast as those in foreign countries; and there are some districts in London which make the Mission Society ask themselves whether they have a right to send men into them. From the returns of 12 unions it is found that 3567 widows and orphans are chargeable to the cholera of 1848-9, entailing an expenditure of 121,000*l.* in four years only.

The highest ratio of loss in any attack made by large fleets will be found in Lord Exmouth's bombardment of Algiers, where the casualties reached 147 per 1000; but the historian James asserts, that, in the official returns relating to the attack upon Copenhagen, the slightly wounded were not included, and that the total number of casualties was 1200. If the historian's statement be admitted, the total loss in that action must have been at the rate of 150 per 1000, which would be greater than at Algiers.—*W. B. Hodge.*

It appears that the total number of deaths in the cholera-year (1849), for all England and Wales, was 440,839; but in 1850 the number of deaths fell to 368,995, "being not only 71,844 less than in the cholera-year, but even less than the number of deaths of the year preceding that of the cholera, by as many as 30,838. . . . . If we take the deaths of the two years together which preceded the cholera, and strike the mean, and treat the year of the cholera, and the compensating year that follows, in the same manner, we shall find that the four years present nearly the same average. . . . . So that in reality it is found, when the

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aggregate of the four years is taken, either for the whole of England, or for the metropolis only, that no greater number of people died in those years because of the cholera intervening than if the cholera had not visited us."—*Dr. Granville, in the Medical Times and Gazette.*

LONGEVITY OF SOLDIERS AND SAILORS.

The life of a soldier is more favourable to longevity than that of a sailor. Sir Henry Halford, in 1837, had the returns of the establishments of Greenwich and Chelsea Hospitals, the former of which (Greenwich) contained 2710 pensioners; the latter (Chelsea) only 508. Now it was stated to Sir Henry, that of the 2710, several had reached the age of 80, and even of 90 years, but very rarely indeed 100; whereas, at Chelsea, containing only 500, scarcely a year passes in which some one does not die at 100.

AVERAGE OF HUMAN LIFE.

The average of Human Life is about 33 years. One quarter die previous to the age of seven years; one half before reaching 17; and those who pass this age enjoy a felicity refused to one half the human species. To every 1000 persons, only one reaches 100 years of life; to every 100, only six reach the age of sixty-five; and not more than one in 500 lives to eighty years of age. There are on earth 1,000,000,000 inhabitants; and of these 33,333,333 die every year, 91,824 every day, 3730 every hour, and 60 every minute, or one every second. These losses are about balanced by an equal number of births. The married are longer lived than the single; and, above all, those who observe a sober and industrious conduct. Tall men live longer than short ones. Women have more chances of life in their favour previous to being fifty years of age than men have, but fewer afterwards. The number of marriages is in proportion of 75 to every 1000 individuals. Marriages are more frequently after the equinoxes; that is, during the months of June and December. Those born in the spring are generally more robust than others. Births and deaths are more frequent by night than by day.—*Quarterly Review.*

HOURS MOST FATAL TO LIFE.

A writer in the *Quarterly Review* says: "We have ascertained the hour of death in 2880 instances of all ages, and have arrived at interesting conclusions. We may remark, that the population from which the *data* are derived is a mixed population in every respect, and that the deaths occurred during a period of several years. If the deaths of the 2880 persons had occurred indifferently at any hour during the 24 hours, 120 would have occurred at each hour. But this was by no means the case. There are two hours in

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which the proportion was remarkably below this—two *minima*, in fact—namely, from midnight to 1 o'clock, when the deaths were 83 per cent below the average, and from noon to 1 o'clock, when they were 20¼ per cent below. From 3 to 6 o'clock, A.M. inclusive, and from 3 to 7 o'clock P.M., there is a gradual increase, in the former of 23½ per cent above the average, in the latter of 5½ per cent. The *maximum* of death is from 5 to 6 o'clock A.M., when it is 40 per cent above the average; the next, during the hour before midnight, when it is 25 per cent in excess; a third hour of excess is that from 9 to 10 o'clock in the morning, being 17½ per cent above. From 10 A.M. to 3 P.M. the deaths are less numerous, being 16½ per cent below the average, the hour before noon being the most fatal. From 3 o'clock P.M. to 7 P.M. the deaths rise to 5½ per cent above the average, and then fall from that hour to 11 P.M., averaging 6½ per cent below the mean. During the hours from 9 to 11 o'clock in the evening there is a *minimum* of 6½ per cent below the average. Thus the least mortality is during midday hours, namely, from 10 to 3 o'clock; the greatest during early morning hours, from 3 to 6 o'clock."

OPERATION OF MIND.—"THE GREAT BOOK."

Mr. Samuel Warren says: "I do not know how to express it, but I have several times had a transient consciousness of mere ordinary incidents then occurring having somehow or other happened before, accompanied by a vanishing idea of being able to predict the sequence. I once mentioned this to a man of powerful intellect, and he said, 'So have I.' Again, it may be that there is more of truth than one suspects in the assertion which I met with in a work of M. de Quincey's, that *forgetting*—absolute forgetting—is a thing not possible to the human mind. Some evidence of this may be derived from the fact of long-missed incidents and states of feeling suddenly being reproduced, and without any perceptible train of association. Were this to be so, the idea is very awful; and it has been suggested by a great thinker that merely perfect memory of every thing may constitute the *great book* which shall be opened in the last day, on which man has been distinctly told that the secrets of all hearts shall be made known; for *all things are naked and opened unto the eyes of him with whom we have to do.*" (Heb. iv. 13.)

An old man, in describing the sensations he felt at drowning, when he was with difficulty recovered, said he had the ringing of bells in his ears, which increased as consciousness was becoming less; and he felt as if "all the bells of Heaven were ringing him into Paradise!"—"the most soothing sensation."

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DEATH BY LIGHTNING.

Few persons who have not inspected a human body struck by lightning have an idea of the mode in which the stroke effects a sudden termination of life. The visible alterations in the frame afford a striking contrast to the ordinary ravages of what is termed disease. The machinery of the body appears nearly perfect and unscathed; yet in none of the multitudinous forms of death is the living principle so summarily annihilated.

DEATH BY COLD.

The immediate cause of death by cold is apoplexy. The heart is arrested and paralysed in the exercise of its office, and no longer supplies the brain with arterial blood. Nor is the blood thrown with sufficient force to the extremities. It accumulates, therefore, in the large vessels proceeding immediately from the main spring, and there is no ingress for the blood returning from the brain. The large sinuses, therefore, become overgorged, and apoplexy follows.

When the cold has not been severe enough to destroy life entirely, it mutilates the extremities, and mortification ensues from a want of circulation. The Lascars, who arrive in this country from India in the winter season, are very prone to this effect of a climate so much colder than their native one, as the records of the city-hospitals abundantly prove.—*Sir Henry Halford.*

COLD FAVOURABLE TO LONG LIFE.

Sir Henry Halford was informed by the Russian Ambassador, Baron Brunow, that there was a level country of about 100 leagues square, sloping to the south, on the borders of Siberia, where a year rarely passed in the course of which some person did not die of the age of 130. The question asked, of course, was, "Can you depend upon your registers there?" To which the reply was: "Any body who knows the practices of the Greek Church will tell you that the bishops are more careful of their registration there, if possible, than your parochial clergy are in Great Britain."

In the year 1835, there died in the Russian empire 416 persons of 100 years of age and upwards; the oldest was 135 years, and there were 111 above 110 years old.

HYPNOLOGY; OR, HOW TO PROCURE SLEEP.

Dr. Binns, in his *Anatomy of Sleep*, recommends the following means of procuring Rest. Let the person turn on his left side, place his head comfortably on the pillow, so that it exactly occupies the angle a line from the head to the

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shoulder should form; and then, slightly closing his lips, let him take rather a full respiration, breathing as much as he possibly can through the nostrils. Having taken a full inspiration, the lungs are then to be left to their own action, that is, the respiration is neither to be accelerated nor retarded. The patient should then depict to himself that he sees the breath passing from his nostrils in a continuous stream; and the very instant that he brings his mind to conceive this apart from all other ideas, consciousness and memory depart, imagination slumbers, fancy becomes dormant, thought subdued, the sentient faculties lose their susceptibility, the vital or ganglionic system assumes the sovereignty, and he no longer wakes, but sleeps. This train of phenomena is but the effect of a moment. The instant the mind is brought to the contemplation of a single sensation, the sensorium abdicates the throne, and the hypnotic faculty steeps it in oblivion.

CAUSES OF TRANCE.

Dr. Sir Henry Holland, in his *Medical Notes*, observes that, "as respects magnetic sleep or trance in all its alleged shapes, there is no well-authenticated fact making it needful to believe that an influence is received from without, beyond those impressions on the senses which are capable, according to the temperament and other circumstances of existing disordered as well as healthy actions, throughout every part of the nervous system, and especially in the sensorial functions."

MORNING DREAMS.

The old notion of the "*Somnia vera*" of approaching day—"Morning dreams come true," is interpreted by the physical state of sleep being then less perfect: trains of thought suggested follow more nearly the course of waking associations, and the memory retains them; while earlier and more confused dreams are wholly lost to the mind.

NATURE OF SLEEP.

It is not uncommon to hear persons attribute the sleeping of "guilty creatures" to hardness of heart, or recklessness. This is an error, referable to ignorance of the nature of sleep, and of the fact "that all degrees of excitement in the parts of the brain and spinal marrow, associated with the nerves of the sensitive system, are followed by proportional exhaustion. The only limit to this law is the capability of bearing in those parts. Exhausted by mental excitement, the criminal is often awakened for his execution; and the soldier, both by mental and bodily excitement, sleeps by the roaring cannon."—*Dr. Philip.*

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The Animal Kingdom.

STRUCTURE OF MAN.

One of the most splendid results of Comparative Anatomy is that Man is no longer regarded as though he were distinct in his anatomy from all the rest of the animal creation; but his structure is perceived to be an exquisite modification of many other structures, the whole of which have been recognised as modifications of one and the same general pattern. Every one of the 260 bones which may be enumerated in the human skeleton can be unerringly traced in the skeletons of many hundred inferior animals; and the human anatomist of our day begins to comprehend the nature of his own structure in a way never dreamed of by his predecessors.—*Samuel Warren, D.C.L.*

WEIGHT AND STATURE OF MEN OF DIFFERENT COUNTRIES.

	lbs. av.
The mean weight in Belgium (Brussels) and the environs is	140·49
In France (Paris and neighbourhood) the man is .	136·69
The mean weight of the Englishman (taken at Cambridge) from 18 to 25	150·98
(In carriages it is usually considered that it averages 165 lbs.)	
The mean height of the Belgian male is . . .	5 ft. 6$\frac{3}{10}$ in.

	ft. in.
The mean height of the Frenchman is	5 4
Ditto Englishman . . .	5 9$\frac{1}{2}$

In recruiting for the French army the standard is now fixed at 1·566 metres of height, which is about 5 feet 1$\frac{1}{2}$ inches English. Fifty years ago, however, the French standard height was 5 feet 4 inches English.

The English standard is for the Foot Guards 5 feet 6 inches.

MECHANISM OF THE BONES.

In the Human Skeleton there are commonly enumerated 260 Bones, which present every variety of size and figure. But all these varieties may be reduced to three classes: the long and round, as the bones of the upper extremities; the broad and flat, as the bones of the skull; or the short and square, as the separate bones that compose the vertebral column. The long bones are adapted for motion, the flat for protection, and the square for motion combined with strength. Accordingly, the long bones are moulded into lengthened cylinders, and form so

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many levers, exquisitely constructed and combined. In the employment of the flat bones for the covering of some of the more tender and delicate organs, as the brain and spinal cord, the form of these bones adds to their strength, as in the vaulted roof of the skull; while in the construction of the vertebral column, composed of the short and square bones, which are so adjusted as to afford a limited range of motion with a great degree of strength, so many and such opposite purposes are effected by means so simple yet so efficient, that no fabric constructed by human ingenuity approaches the perfection of this admirable piece of mechanism.

PECULIARITIES IN THE HAND.

Nothing is more remarkable, as forming a part of the prospective design to prepare an instrument fitted for the various uses of the Human Hand, than the manner in which the delicate and moving apparatus of the palm and fingers is guarded. The power with which the hand grasps, as when a sailor lays hold of the rope to raise his body in the rigging, would be too great for the texture of mere tendons, nerves, and vessels; they would be cracked were not every part that bears the pressure defended with a cushion of fat, as elastic as that which is in the foot of the horse and the camel. To add to this purely passive defence, there is a muscle which runs across the palm, and more especially supports the cushion on its inner edge; it is this muscle which, raising the edge of the palm, adapts it to lave water, forming the cup of Diogenes. In conclusion, what says Ray? "Some animals have horns, some have hoofs, some teeth, some talons, some claws, some spurs and beaks; man hath none of all these, but is weak and feeble, and sent unarmed into the world;—why, a hand, with reason to use it, supplies the use of all these!" —*Sir Charles Bell, F.R.S., on the Hand.*

HEADS OF ENGLISHMEN.

The following is a comparative estimate of the dimensions of the Head of the inhabitants in several counties of England:

The male Head in England, at maturity, averages from 6½ to 7⅛ in. in diameter; the medium and most general size being 7 inches. The female head is smaller, varying from 6⅜ to 7 or 7⅛ in., the medium male size. Fixing the medium of the English head at 7 inches, there can be no difficulty in distinguishing the portions of society above from those below that measurement.

London.—The majority of the higher classes are above the medium, while amongst the lower it is very rare to find a large head.

Spitalfields Weavers have extremely small heads, 6½, 6⅝, 6¾ in. being the prevailing admeasurements.

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Coventry.—Almost exclusively peopled by weavers: the same facts are peculiarly observed.

Hertfordshire, Essex, Suffolk, and *Norfolk* contain a larger proportion of small heads than any part of the empire; Essex and Hertfordshire particularly. 7 inches in diameter is here, as in Spitalfields and Coventry, quite unusual. 6¾ and 6⅞ are more general; and 6⅞, the usual size for a boy of six years of age, is frequently to be met with here in the full maturity of manhood.

Kent, Surrey, and *Sussex.*—An increase of size of the usual average is observed; and the inland counties, in general, are nearly upon the same scale.

Devonshire and *Cornwall.*—The heads of full sizes.

Herefordshire.—Superior to the London average.

Lancashire, Yorkshire, Cumberland, and *Northumberland* have more large heads, in proportion, than any part of the country.

Scotland.—The full-sized head is known to be possessed by the inhabitants; their measurement ranging between 7¾ and 7⅞ even to 8 inches. This extreme size, however, is rare.

THE HUMAN HAIR TURNING GRAY.

Dr. Allen Darnell, in a Dissertation which gained the gold medal in the University of Edinburgh in 1853, relates: "Grief, fear, and other emotions, are well known to alter the character of the secretions; and such mental conditions are known also to have been the proximate causes of sudden changes of the Hair. The hair of a lady in my own family connection, from some distressing circumstances which deeply affected her, became gray in a single night. A medical man in London, less than twenty years ago, under the fear of bankruptcy, had his dark hair so changed in the same period that his friends failed to recognise him; but the colour in this instance returned, as his worldly prospects revived. M. Roulin states, that a friend of his, terrified by the prospect of losing his fortune, had the hair on the side on which he reposed turned to gray in a single night."

THE STEAM-ENGINE AND THE HUMAN BODY.

We find, in Dr. Neil Arnott's new work on *Warmth and Ventilation,* the following ingenious comparison:

James Watt, when devising his first engine, knew well that the rapid combination of the oxygen of atmospheric air with the combustible fuel in the furnace, produced the heat and the force of the engine; but he did not know that in the living body there is going on, only more slowly, a similar combination of the oxygen of the air with the like combustible matter in the food, as this circulates after digestion in the form of blood through the lungs, which combination produces the warmth and force of the living animal. The chief resemblances of the two objects are exhibited strikingly in the following table of comparison, where in two adjoining columns are set forth nearly the same things and actions, with difference in the names:

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Table of Comparison.

THE STEAM-ENGINE IN ACTION TAKES:	THE ANIMAL BODY IN LIFE TAKES:
1. FUEL, viz. coal and wood, both being old or dry vegetable matter, and both combustible.	1. FOOD, viz. recent or fresh vegetable matter and flesh, both being of kindred composition and both combustible.
2. WATER.	2. DRINK (essentially water).
3. AIR.	3. BREATH (common air).
AND PRODUCES:	AND PRODUCES:
4. STEADY BOILING HEAT of 212 degrees by quick combustion.	4. STEADY ANIMAL HEAT of 98 degrees by slow combustion.
5. SMOKE from the chimney, or air loaded with carbonic acid and vapour.	5. FOUL BREATH from the windpipe, or air loaded with carbonic acid and vapour.
6. ASHES, part of the fuel which does not burn.	6. ANIMAL REFUSE, part of the food which does not burn.
7. MOTIVE FORCE, of simple alternate push and pull in the piston, which, acting through levers, joints, bands, &c., does work of endless variety.	7. MOTIVE FORCE, of simple alternate contraction and relaxation in the muscles, which, acting through the levers, joints, tendons, &c., of the limbs, does work of endless variety.
8. A DEFICIENCY OF FUEL, WATER, OR AIR first disturbs and then stops the motion.	8. A DEFICIENCY OF FOOD, DRINK, OR BREATH first disturbs and then stops the motion and the life.
9. LOCAL DAMAGE from violence in a machine is repaired by the maker.	9. LOCAL HURT OR DISEASE in a living body is repaired or cured by the action of internal vital powers.

Such are the surprising resemblances between an inanimate machine, the device of human ingenuity executed by human hands, and the living body itself, yea, the bodies of the men whose minds contrive and whose fingers make such machines. A prodigious difference, however, between the two is pointed out by the expression *vital powers*, contained in the last line of the preceding table. That difference, described in a few words, is, that while the machine has to be originally constructed, and afterwards worked and repaired and supplied with every necessary, by intelligence and forces altogether external to it, the animal body performs all the offices mentioned, and others yet more surprising, for itself, by virtue of forces or powers originally placed within it by the divine Author of Nature.

NUMBER OF ANIMALS.

Agassiz and A. A. Gould estimate the number of *Vertebrated Animals* at 20,000. About 1500 species of *mammals* are ascertained; probable number, 2000. *Birds*, well known, 4000 or 5000 species; probable number, 6000. *Reptiles*, 1500 described species; probable number, 2000. *Fishes*, 5000 to 6000 in the museums of Europe; probable number, 8000 or 10,000. *Mollusks* in collections, 8000 or 10,000. *Marine shells*, bivalve and univalve, in collections, 5000 or 6000; and *land and fluviatile shells*, 2000. Total number of mollusks probably exceeds 15,000 species. *Insects*, in collections, probably 60,000 or 70,000 species; probable number of *articulata*, 100,000; species, 200,000. Add to these, 10,000 for *radiata* (echini, star-fishes, medusæ, and polypi), and we have about 250,000 species of living animals; and supposing the number of *fossil* species to equal them, we have, at a very moderate computation, half a

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million species. We quote this estimate from MM. Agassiz and Gould's *Principles of Zoology*, Part I., 1848. The numbers are considered to be mostly under the present mark: the Birds, for example, are certainly more numerous, and probably amount to 8000 species.

THE ELEPHANT.

The size of the Elephant appears to have been strangely over-stated by travellers. Major Denham relates that he saw troops of elephants 16 feet high! "We venture to say," observes the *Quarterly Review*, "that there is not in all Africa an elephant 11 feet high, and very few either in Ceylon or Siam, or Pegu, or Cochin China, where they are found of the largest size, that ever exceed that height." But

> "Geographers in Afric maps
> With savage pictures fill their gaps;
> And o'er uninhabitable downs
> Place elephants, for want of towns."

Sir Walter Scott, upon seeing a very fine elephant, observed: "I was never before sensible of the dignity which largeness of size and freedom of motion give to this otherwise ugly animal." The elephant appears more sagacious than he really is, because the facial line, or the vertical height of the skull, when compared with its horizontal length, is elevated by causes which have no connection with the volume of the brain.

THE HIPPOPOTAMUS—BEHEMOTH.

It is singular to many who know the Greek name of this animal to signify *river-horse*, that he should be so unlike a horse. Nevertheless, the Greeks, who knew him only at a distance, as we did formerly, named him from his voice and ears after an animal which he so little resembles in other respects. The Egyptian words from which the behemoth of Job (xl. 10) are derived, more fitly designate him as *water-ox*, *Be-hemo-tit*—literatim, the aquatic ox.—*Notes and Queries*, No. 120.

THE ORANG-OUTANG

is named from the Malay, *oran-utan*, literally man of the forest, but more correctly a rude or uncivilised man, a savage, a clown, a rustic. The accent, as in nearly all Malay words, is on the penultimate in both words, and not, as we make it, on the last syllable. The naturalists, taking the Bornean individual as the type, establish a class of monkeys under the name of Ourangs; but the propriety of the term is very questionable indeed,—seeing that *orang* means a human being, and is translated by the Latin word *homo*. The name of orang-outang for any kind of monkey is unknown to the Malays,—and the natives of Borneo call the animal *mias*.—*Crawfurd*.

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THE KANGAROO

was certainly supposed to be an Australian word by Captain Cook, who first used it, and described the remarkable animal to which it is applied; yet it is strange that no such term is to be found in any Australian language.—*Craufurd.*

ARCHITECTURE OF THE BEAVER.

The stories of the Beaver using its long, broad, and flat tail as a trowel are impositions on the credulous. The tail is altogether unfitted for such operations: for mixing up the mud with other materials the animal employs its fore-paws and the mouth; while it employs the tail in the water as a paddle and rudder, to urge itself onward, and to direct its course. With its powerful incisor teeth it strips off and divides the bark of trees, which forms its principal nutriment; and it gnaws the rough thick trunks to obtain the timber for building its habitation. Its teeth are reproduced from the base as fast as they are worn down at the extremity. By good authority it is stated, that a beaver will lop off with its teeth, at a single effort, a stem of the thickness of a common walking-stick, as cleanly as if done by a gardener's pruning-knife. The fur of the beaver was universally used more than two centuries since for making hats, in consequence of a proclamation issued in the year 1638, forbidding the use of any materials for hats except beaver-stuff, or beaver-wool. The remains of beaver-dams found in Wales prove that this animal was once a native of Britain.

OLDEN FURS.

In the domestic history of the manners of past ages *minever* is the fur of the ermine mixed with that of the small weasel (menervir), called "gris or grey" (*Cotgrave*). The nobility had their caps of ermine and sable; the wealthy merchants of vair and grey ("the dainty minever"); the humbler classes of people, of the squirrel, lamb, rabbit-skins, &c.

THE HYENA NOT UNTAMEABLE.

The common notion that the Hyena cannot be tamed is a popular error. Ignatius Pallme, in his *Travels in Kordofan*, tells us that the Africans do not even reckon the hyena among the wild beasts of their country, for they are not afraid of it. He saw at Lobeid a domesticated hyena; the children played with it and teazed it; and a full-grown hyena and her two cubs were once brought to the traveller by a native in his arms for sale.

A LIVING OX OF A FORMER WORLD.

In the Gardens of the Zoological Society in the Regent's

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Park are two living examples of the Aurochs, Zubr, or European bison, a species of primeval ox, which appears to be the only one of that class of quadrupeds that is living in our own day, which once roamed over all the woodland districts of central Europe, and which, in our own island, was contemporary with the extinct races of mastodon, elephant, and rhinoceros. The aurochs exists only in one locality, in the forest of Bialavieja in Lithuania, where it is carefully protected by the Russian government from extirpation. As a royal hunting-ground it has been preserved in the primitive state of an American forest, inhabited by bears, wild boars, wolves, foxes, lynxes, elks, and roebucks, together with the aurochs: the latter animal lives about forty years, is of great weight, and a slow mover, but in defence can master three wolves. The young male and female in the Regent's Park were captured in 1846, when very young, and were presented to the Zoological Society by Nicholas, Emperor of Russia, whose munificence in the patronage of science and its professors must not be forgotten amidst the misdeeds of an enemy. There are also, in the British Museum, a pair of stuffed specimens of the aurochs, derived from the same imperial source.*

EARS OF THE HORSE.

It is a good sign for a horse to carry one ear forward and the other backward when on a journey, because this stretching of the ears in contrary directions shows that he is attentive to every thing that is taking place around him; and while he is so doing, he cannot be much fatigued, or likely soon to become so. Few horses sleep without pointing their ears as above, that they may receive notice of the approach of objects in every direction. "When horses or mules," says Dr. Arnott, "march in company at night, those in the front direct their ears forward, those in the rear direct them backward, and those in the centre turn them laterally or across; the whole troop seeming thus to be actuated by one feeling, which watches the general safety."

THE STRIDE OF A RACE-HORSE.

Mr. J. F. Herring, sen., the celebrated animal-painter, states that a Race-horse will clear from 20 to 24 feet at a bound; and from the impression left on the turf he infers that a horse at full gallop places only one foot at a time upon the ground.

* Two other specimens have been found. Sir Roderick Murchison states, that "on reference personally to Baron Humboldt, since the publication of his work on Central Asia, the great traveller expressed it as his opinion that the perfect preservation of the skin, mustachios, and whole body of Prince Menzikoff, buried *a hundred years ago* in Siberia, and accidentally disinterred, ought to satisfy us respecting the conservation of the mammoth by simple reference to the climate of that country."

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This, he says, is more convincing to the ear than to the eye. In listening to a horse galloping on a hard road, it will be found accurately exhibited by placing the little finger on a table or a pane of glass, and causing the other three fingers to follow in rotation; by so doing, the precise sound of that of a horse galloping will be produced. Then follows the bound, and again the 1, 2, 3, 4, in regular succession; or, as Virgil gives it in his imitative line (*Æn.* viii. 596):

"Quadrupedante putrem sonitu quatit ungula campum."

MERINO SHEEP,

it is supposed, are named from the adjective term *merino*, applied by the Spaniards to sheep moving from pasture to pasture: they are the *fine-wooled kind*, are always in the open air, and travel every season from the cool mountains of the northern portions of the kingdom to feed in winter over the southern and warmer plains of Andalusia, Mancha, and Estremadura. There are supposed to be in Spain about ten millions of this fine-wooled travelling race, tended by about fifty thousand shepherds, and guarded by thirty thousand dogs.—*North British Review*, No. 9.

MOLES AND MOLE-HILLS.

In those districts where Moles abound, it may be remarked that some of the Mole-hills are considerably larger than others. When a hill of enlarged dimensions is thus discovered, we may be almost certain of finding the nest or den of the mole near it, by digging to a sufficient depth. The fur of the mole is admirably adapted, from its softness and soft close texture, for defending the animal from subterraneous damp; although in our climate no choice of situation could entirely guard against it. It is a singular fact, that there are no moles in Ireland. May not the dampness of the climate account for their not thriving there? M. Flourens states, that the mole, if not exclusively, is essentially carnivorous: it very soon dies if only roots be given to it; and if it destroy so many roots of vegetables, it is not for the purpose of eating them, but to seek among them for worms, insects, and larvæ. Moles may be kept alive for a long time upon any animal food; ten or twelve hours is the longest time they can live without food; and like all animals which feed upon blood and flesh, the mole is always very thirsty. Again, Cuvier tells us that moles are so voracious as not even to spare their own species. If two are shut up together without food, there will shortly be nothing left of the weakest but its skin, slit along the belly.

ERRORS RESPECTING BATS.

These harmless and interesting little animals have not only

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furnished objects of superstitious dread to the ignorant, but have proved to the poet and the painter a fertile source of images of gloom and terror. The strange combination of character of beast and bird, which they were believed to possess, gave to Virgil the idea of the Harpies. Aristotle speaks of Bats as having feet as birds, but wanting them as quadrupeds; of their possessing neither the tail of quadrupeds nor of birds; of their being, in short, birds with wings of skin. He is followed, but with increasing error, by Ælian and by Pliny; the latter of whom says that the bat is the only bird which brings forth young, and suckles them. Even up to a late period bats were considered as forming a link between quadrupeds and birds. The common language of our own ancestors, however, indicates a much nearer approach to the truth in the notions entertained by the people than can be found in the lucubrations of the learned. The words *reremouse* and *flittermouse*, the old English names for the bat,—the former derived from the Anglo-Saxon "arsæran," to raise, or rear up, and mus; the latter from the Belgic, signifying "flying or flittering mouse,"—show that in their minds these animals were always associated with the idea of quadrupeds. The first of these terms is still used in English heraldry; though it may have ceased to belong to the language of the country. The word *flittermouse*, sometimes corrupted into *flintymouse*, is the common term for the bat in some parts of the kingdom, particularly in that part of the county of Kent in which the language, as well as the aspect and names of the inhabitants, retain more of the Saxon character than will be found, perhaps, in any other part of England.—*Thomas Bell, F.R.S.*

Bats are now proved to be a wing-handed family of mammiferous animals, which have the faculty of sustained flight; and their organisation and habits point them out as a separate and well-defined group, distinguished by a folding extension of the membraneous skin, which, rising from the sides of the neck, is spread between their fore-feet and their fingers.

CHARACTERISTICS OF THE DOG.

It is remarkable, that from this faithful animal, the companion of man, and the guardian of his person and property, should originate so many terms of vile reproach and low comparison,—as, you dog, you cur, you hound, you whelp, you puppy; so dog's trick, dog cheap, dog trot, dog sick, dog weary, doggerel rhymes, to lead the life of a dog, or to use like a dog. This may be traceable to the East, where the Dog is held in abhorrence as the common scavenger of the streets. "Him that dieth in the city the dogs shall eat," was said of Jeroboam and his family (1 Kings xiv. 11); of Baasha (1 Kings

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xvi. 4), a people about to be punished for their offences by famine and pestilence. A ravenous desire for food is called a canine appetite; and of a foul and gluttonous feeder it is said, that hungry dogs will eat dirty pudding. By the Israelites the dog was accounted so abominable, that in the Levitical law the price of a dog was forbidden to be offered in sacrifice. He has also been ever the miserable victim of most cruel experiments by the anatomist and the philosopher; and when a tax was laid on his head, a general massacre of the species took place. By the Egyptians, however, the dog was an object of adoration, as the representative of one of the celestial signs; and by the Indians, as one of the sacred forms of their deities.

> "The Egyptians worshipped dogs, and for
> Their faith made internecine war."—*Hudibras.*

The Canicular or Dog-days are so called, not because dogs are at that season apt to run mad, but from the heliacal rising of Sirius, or the Dog-star, as typical of the season of greatest heat, or wane of the summer.

In moonlight nights dogs, as the emblems of vigilance, are said to be more than usually watchful, and to "bay the moon;" and they are supposed to have a sense of the odour of mortal dissolution, and to howl before the death of one of the family. They perspire by the tongue; and in hot countries, as in Africa, die if they be suddenly plunged into cold water. The young, or whelps of the dog, as is the case with all quadrupeds which bring forth litters, and have the feet divided into many segments or toes, are born blind, and so continue for ten or twelve days; and at this time they are probably deaf, as the valves of the ears are closed till the eyes are opened.

The dog was formerly taught to turn the spit and roast the meat, by continual exercise in a kind of tread-wheel; hence this kind of dog was called "*the turnspit:*"

> "But as a dog that turns the spit
> Bestirs himself and plies his feet
> To climb the wheel, but all in vain,—
> His own weight brings him back again,
> And still he's in the selfsame place
> Where, at his setting out, he was."—*Hudibras.*

Well-authenticated anecdotes are related of one of a couple of turnspit dogs refusing to work the spit because it was not his turn.

According to Horace, the sight of a bitch with young was considered an unlucky omen; and of a sullen discontented person, we say, that the black dog has walked over him.

Although in China and Tartary the flesh of the dog is used for food, his carcass in Europe is considered worthless, and

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even his skin is now of little value; but the skins of puppies are tanned and made into gloves.

The hair of a dog, when burnt, was formerly prescribed as an antidote against the effects of intoxication; hence a man too much excited by drink at night is recommended to take a hair of the same dog the next morning, as a means of gradually counteracting his state of debility; but the dram is now substituted for the hair.

It is an error to imagine that a mad dog avoids the water; for he will both drink it and swim in it as usual, and without presenting any of that horror of it which characterises Hydrophobia in man.

The greyhound is so called, not from any allusion to colour, but because he came originally from Greece, *Canis Graius;* therefore the name should be written graihound.*

To these notes, principally contributed by Dr. Turton to the *Magazine of Natural History*, may be added the following mention of the dog by Shakspeare:

> "My hounds are bred out of the Spartan kind,
> So flew'd, so sanded; and their heads are hung
> With ears that sweep away the morning dew;
> Crook-knee'd and dew-lap'd like Thessalian bulls;
> Slow in pursuit, but match'd in mouth like bells,
> Each under each."—*Mids. Night's Dream*, act iv. sc. 1.

> "Spaniel like, the more she spurns my love,
> The more it grows, and fawneth on her still."
> *Two Gentlemen of Verona*, act iv. sc. 2.

"That island of England breeds very valiant creatures, their mastiffs are of unmatchable courage."—*Henry V.* act iii. sc. 7.

> "A dog, and bay the moon."—*Julius Cæsar*, act iv. sc. 3.

> "Oft have I seen a hot o'erweening cur
> Run back and bite, because he was withheld;
> Who being suffer'd with the bear's fell paw,
> Hath clapp'd his tail between his legs, and cried."
> *Henry VI.* part ii. act v. sc. 1.

Ben Jonson has some lines of similar purport to that of the former part of the last quotation:

> "The eager but the generous greyhound,
> Who, ne'er so little from his game withheld,
> Turns head, and leaps up at his holder's throat."
> *Every Man in his Humour.*

* Mr. Jesse notes, in his *Gleanings:* "Every one has observed that Dogs, before they lie down, turn themselves round and round several times. Those who have had an opportunity of witnessing the actions of animals in a wild state, know that they seek long grass for their beds, which they beat down, and render more commodious by turning round in it several times. It would appear, therefore, that the habit of our domestic dogs in this respect is derived from the nature of the same species in the wild state. This is a curious fact, and serves to prove how much the instinctive habits of wild animals are retained by their domesticated progeny."

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BARKING OF DOGS.

The Australian dog never barks; indeed Gardiner, in his *Music of Nature*, states, that "dogs in a state of nature never bark; they simply whine, howl, and growl; this explosive noise is only found among those which are domesticated." Sonnini speaks of the shepherds' dogs in the wilds of Egypt as not having this faculty; and Columbus found the dogs which he had previously carried to America to have lost their propensity to barking. The barking of a dog is an acquired faculty,—an effort to speak, which he derives from his association with man.—*E. T. Bennett.*

CHARACTERISTICS OF THE CAT.

The Cat was originally brought from Persia, and was unknown to Pliny and the Roman writers; and the term puss is thought to be a corruption of *pers*. She is the emblem of the moon, from the great changeableness of the pupil of the eye, which in the daytime is a mere narrow line, dilatable in the dark to a luminous globe; and she can, for this reason, like most animals of prey, see best by night.

In a Japanese encyclopædia we find it stated, that the tip of the cat's nose is always cold, except on the day corresponding with our Midsummer-day.

It was formerly the trick of a countryman to substitute a cat for a sucking-pig, and bring it to market in a bag; so that he who, without careful examination, made a hasty bargain, was said to buy a pig in a poke, and might get a cat in a bag; and a discovery of this cheat gave rise to the expression of *letting the cat out of the bag*, as a premature and unlucky disclosure.

The fur of the cat was of old used in trimming cloaks and coats; and in allusion to the unfitness of her flesh for food, it is said of any thing confined to one purpose only, What can you have of a cat but her skin? The catgut used for rackets, and for the finer strings of violins, is made from the dried intestines of the cat; the larger strings being from the intestines of sheep and lambs. A smaller kind of fiddle is called a kit. The scratch of the cat is supposed to be venomous, because a lacerated wound is more apt to fester than a definite cut with a sharp instrument. The tenacity of her hold has given origin to many metaphorical expressions and appellations, as the cat, or tackle, on board ship; and a cat-o'-nine-tails, or scourge, so called from the scratches it leaves on the skin, like the clawings of a cat. An implement for holding a plate before the fire, with six spokes or radii, three of which rest on the ground, in whatever position it is placed, is called *a cat*, from a belief that, however a cat may be thrown,

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she always falls on her legs. This cats usually do, because of the facility with which they balance themselves when springing from a height; which power of balancing is in some degree produced by the flexibility of the heel, the bones of which have no fewer than four joints. Again, cats usually alight softly on their feet, because in the middle of the foot is a large ball, or pad, in five parts, formed of an elastic substance; and at the base of each toe is a similar pad. It is impossible to imagine any mechanism more calculated to break the force of a fall.

From her great powers of resistance, the cat is said to have *nine lives*. "'Tis a pity you had not ten lives,—a cat's and your own," says Ben Jonson, in *Every Man in his Humour*.

The well-known tale of the monkey seizing hold of the paw of the cat, to get the roasted chestnuts from the hot embers, gave rise to the proverb, "to make a cat's-paw of one," or to make another subservient to one's own services.

This phrase is of greater antiquity than many suppose; for we find a story of a cat and a monkey, in *A Voyage round the World*, by Dr. John Francis Gemelli Careri, in 1695. The Doctor was told by D. Antony Machado de Brito, Admiral of the Portuguese fleet in India, that in order to punish a mischievous monkey he placed upon the fire a cocoa-nut (of which monkeys are very fond), and then hid himself to see how the monkey would take it from the fire without burning his paws. The cunning creature looked about, and seeing a cat by the fireside, held her head in his mouth, and with her paws took off the nut, which he then threw into water to cool, and ate it.

The cat is very subject to vomiting; and every one too much addicted to excess of wine knows what is meant by *shooting a cat*. She is thought to be particularly fond of fish:

> "What female heart can gold despise?
> What cat's averse to fish?"
>
> *Gray, Ode on the Death of a favourite Cat.*

But this is not probable; for if a plate of fish and a plate of meat, either raw or dressed, be placed before a cat, she will generally prefer the meat. It is equally erroneous that she is subject to fleas; the small insect which infests the half-grown kitten being a totally different animal, exceedingly swift in running, but not salient, or leaping, like the flea.

The cat, especially the black kind, is highly charged with electricity, which is visible in the dark, when the cat is irritated, and may be produced as follows:

Place your left hand upon the throat of the cat, and with the middle finger and the thumb press slightly the bones of the animal's shoulders; then, if the right hand be gently passed along the back, perceptible shocks of electricity will be felt in the left hand. Shocks may also be obtained by touching the tips of the ears after rubbing the back. The same may also be obtained from the foot. Placing the cat on your knees, apply your right hand to the back; the left fore paw resting on the palm of your left hand, apply the thumb to the upper side of the paw, so as to extend the claws, and by this means bring your fore-

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finger into contact with one of the bones of the leg, where it joins the paw; when, from the knob, or end of this bone, the finger slightly pressing on it, you may feel distinctly successive shocks, similar to those obtained from the ears.

The attitudes and motions of the cat are of great elegance, in consequence of her being furnished with collar-bones: she can therefore convey food to her mouth by the paw, like the monkey; can climb and clasp, strike sideways, toss her prey upwards, and seat herself on an eminence of very confined and narrow surface.

One of the frauds of witchcraft was the witch pretending to transform herself into a certain animal, the favourite and most usual transformation being a *cat;* hence cats were tormented by the ignorant vulgar. Steevens, the commentator on Shakspeare, states, that in some counties of England, a cat was formerly closed up with a quantity of soot in a cask suspended on a line. He who beat out the bottom of the cask as he ran under it, and was nimble enough to escape the contents, was regarded as the hero of this inhuman diversion, which was terminated by hunting to death the unfortunate cat.

There is an odd notion common that white cats with blue eyes are always deaf; but this is disproved by a Correspondent of *Notes and Queries*, No. 157, who mentions a cat of this kind, which at the age of seventeen years retained its hearing to great perfection.

Cats attain a large size. In 1850 we saw, at No. 175 Oxford-street, a beautifully marked tabby male cat, weighing 25¾ lbs., and measuring 27 inches round the body, and 36 inches from the tip of the tail to the end of the nose; height to top of shoulders, 11½ inches. He was then seven years old.

Cats were formerly made to perform feats, and dance to a fiddle; and in Pool's *Twists and Turns about the Streets of London* (17th century) is described "a poor half-naked boy, strumming on a violin, while another urchin, with a whip, makes two poor starved cats go through numerous feats of agility."

It is related of Charles James Fox, that, walking up St. James's-street from one of the club-houses with the Prince of Wales, he laid him a wager that he would see more cats than the prince in his walk, and that he might take which side of the street he liked. When they reached the top, it was found that Mr. Fox had seen thirteen cats, and the prince not one. The royal personage asked for an explanation of this apparent miracle. Mr. Fox said, "Your royal highness took, of course, the shady side of the way, as most agreeable; I knew that the sunny side would be left for me, and *cats always prefer the sunshine.*"

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THE TORTOISESHELL TOM CAT.

A Tortoiseshell Tom Cat, and a Queen Anne's Farthing, appear in popular estimation to enjoy a corresponding rarity. The coin is scarce, and so is the cat; but neither is so rare as traditional tale would have us believe, for this hardly allows existence. The "tortoiseshell" is one of the most noted of the varieties of the domestic cat; and its marks, resembling those in the shell of the tortoise, are ascribed to a cross breed of black and yellow. Males are scarce; and every year specimens are offered for sale to the Zoological Society of London, as rarities worthy of a place in their fine menagerie. In the autumn of 1851, Mr. John Thurston, of Waltham-le-Willows, in Suffolk, possessed a handsomely marked "Tortoiseshell Tom," fifteen months old.

FLIGHT OF BIRDS.

Hawks, and many other birds, probably fly at the rate of 150 miles an hour; an eider-duck, at 90 miles an hour. Sir George Cayley computes the common crow to fly at nearly 25 miles an hour. Spallanzani found the rate of the swallow at about 92 miles an hour; while he conjectures the rapidity of the swift to be nearly three times greater. A falcon which belonged to Henry IV. of France, escaped from Fontainebleau, and in 24 hours afterwards was found at Malta, a distance of not less than 1530 miles; a velocity nearly equal to 57 miles an hour, supposing the falcon to have been unceasingly on the wing. But, as such birds never fly by night, and allowing the day to be at the longest, his flight was, perhaps, equal to 75 miles an hour. If we even restrict the migratory flight of birds to 50 miles an hour, how easily can they perform their most extensive migrations! Fair winds may perhaps aid them at the rate of 30 or 40 miles an hour; nay, with three times greater rapidity.—*Dr. Fleming's Philosophy of Zoology.*

THE PELICAN FEEDING HER YOUNG.

The Pelican, having filled her pouch with fish, in order subsequently to disgorge the contents in feeding her young, presses her pouch on her breast, which operation gave rise to the fable of the pelican opening her breast to nourish her offspring "with the blood distilled from her." Thus it is set forth, not only in common signs, but in the crest and scutcheon of many noble families; hath been asserted by many holy writers, and was an hieroglyphic of piety and pity among the Egyptians.—*Sir Thomas Browne on the Picture of the Pelican: Vulgar and Common Errors*, book v. chap. i.*

* Sir Thomas Browne's description of a Pelican corresponds with that of one exhibited in King-street, Westminster, in 1647.

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Eucherius confesses it to be the emblem of Christ. Jerome describes the pelican, thus restoring her young ones destroyed by serpents, as illustrating the destruction of man by the old serpent, and his restorement by the blood of Christ. There are like relations by Austin, Isidore, Albertus, and many more; and under an emblematical intention we accept it on coat-armour.

Shakspeare, in Hamlet, thus alludes to the popular notion:

> "To his good friends thus wide I'll ope my arms,
> And like the bird, life-rendering pelican,
> Repast them with my blood."

The pelican feeding her young was the device of Bishop Fox; and is beautifully sculptured in the altar-screen of St. Mary Overie's Church, Southwark: hence the screen is attributed to this prelate. (*See Curiosities of London*, p. 157.)

THE ORNITHORHYNCUS.

Two specimens of this extraordinary animal were shown in the Great Exhibition of 1851. It is also called the Duck-billed Platypus, is a native of Australia, and resembles the beaver and the otter in its fur covering. The head is rather flat, and the mouth has a flat bill like that of the duck; it is, notwithstanding this marvellous incongruity, a very pretty animal. When first sent to this country, it was received by naturalists with suspicion, and it was doubted whether the bill was naturally attached to the body. Sir Henry Halford succeeded in establishing the fact of its reality. Sidney Smith humorously characterises the Ornithorhyncus as "a quadruped as big as a large cat, with the eyes, colour, and skin of a mole, and the bill and web-feet of a duck, puzzling Dr. Shaw, and rendering the latter half of his life miserable from his utter inability to determine whether it was a bird or a beast."

NOTE OF THE CUCKOO.

The Cuckoo may be said to have done much for musical science: because from that bird has been derived the *minor scale*, the origin of which has puzzled so many; the cuckoo's couplet being the *minor third* sung downwards.

THE NIGHTINGALE.

The Germans are the finest appreciators of this bird; and it is a fact, that when the Prussian authorities, under pecuniary pressure, were about to cut down certain trees near Cologne, which were frequented by nightingales, the alarmed citizens purchased the trees in order to save the birds and keep their music. And yet one would think the music hardly worth

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having, if it really sounded as it looks upon paper, transcribed thus by Bechstein, from whom it is quoted by Broderip:

> Zosozozosozozosozosozosozoso zirrhading
> Hezezesezezezezezesesesezezezezeze cowar ho dze hoi
> Higaigaigaigaigaigaigaigaigaigai, guaiagai coricor dzio dzio pi.
> *Athenæum*, No. 1467

THE GOAT-SUCKER.

From the days of the Roman Republic this bird has passed for an assailant of goats and cows, whereas he simply flies at the udder to capture the insects settled on it. The poor goat-sucker is as often robbed as robbing. The Indians regard the fruits found in the crops of the young as a remedy against intermittent fevers; and the fat of the older bird is so esteemed, that the monks of the Convent of Caripe use it for purposes of cookery.

VARIETIES OF HAWKS.

The *Icelander* is highly esteemed by falconers, because it is the largest hawk known, and is of great power, but of the most tractable disposition. The *Gyr-falcon* is next in size to the icelander, and is much larger than the *Slight-falcon*. These powerful birds are flown at herons and hares, and are the only hawks that are fully a match for the fork-tailed kite. The *Merlin* and *Hobby* are both small hawks, and fit only for small birds, as the blackbird, &c. The *Sparrow-hawk* may also be trained to hunt: his flight is rapid for a short distance; he kills partridges well in the early season, and is the best of all for landrails.—*Sir John Sebright.*

THE BIRD OF MINERVA.

Linnæus, with other naturalists and antiquaries, have supposed that the Horned Owl was the bird of Minerva, the emblem of wisdom among the Greeks. Blumenbach has, however, shown from the ancient works of Grecian art that it was not this owl, but some other smooth-headed species, probably the *Passerina*, or Little Owl.

NIGHT OWLS.

Mr. Adam White, in his excellent *Popular History of Birds*, relates this striking instance of adaptive creation. "It is worthy of remark, that in all owls that fly by night the exterior edges and sides of the wing-quills are slightly recurved, and end in fine hairs or points, by means of which the bird is enabled to pass through the air with the greatest silence—a provision necessary for enabling it the better to surprise its prey."

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THE PASSENGER PIGEON.

One of the most remarkable of the Pigeon family is the Migratory or Passenger Pigeon of North America (*Ectopistes migratorius*), whose numbers almost exceed belief. Audubon, in 1813, witnessed a migration of this species, on the banks of the Ohio, which continued for three days. Allowing two pigeons to occupy a square yard of space, he calculated that a flock contained 1,115,136,000 pigeons; and as it is estimated that each pigeon eats half-a-pint a day, he calculated that such a flock would require 8,712,000 bushels per day. Even with considerable allowances for roughness of calculation, there can be no doubt of the great devastation committed by this bird wherever it abounds. As a set-off to these injuries, Audubon mentions that great numbers of foxes, lynxes, pole-cats, eagles, and hawks, prey on the passenger pigeon: amongst such flocks these predacious beasts and birds must make great havoc.—*Adam White, F.L.S.*

THE BLACK SWAN

was for many ages considered fabulous; it is now by no means "*rara avis in terris.*" It is a native of Australia, and abounds in the rivers and lakes, and on islands on the coast, and has given name to Swan River: of late years it has been introduced into the British isles, where it thrives and breeds.

THE STORMY PETREL.

There is a tradition on board ship that the Petrel is named after St. Peter, from his having walked on the sea. In a gale, petrels surround the ship, and catch up the small animals which the agitated ocean brings near the surface; and when the storm subsides, they are no more seen. Our sailors have, from very early times, called these birds "Mother Carey's Chickens." Thomson says it is "called Pewetrel from its cry" (*Etymons*).

THE STORY OF THE DODO.

This extinct bird was a native of Mauritius, in the Indo-African Ocean, and was first described by Van Neck, a Dutchman, in 1598, in which year a living specimen was embarked for Holland, but died on its way. This specimen is supposed to have been preserved at Leyden; and one of the feet is believed to be that in the British Museum. Several successive voyagers mention the bird, down to Canche, in 1638, in which year a living dodo was brought to England by Sir Hamon l'Estrange, who describes the back as of "dunn or deare colour:" it was exhibited for money, in London, in a house which bore a figure of the bird represented on canvas. This specimen has been traced to Tradescant's Museum at Lambeth, whence it was

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conveyed, in 1682, to Oxford by Ashmole; the body and a leg were destroyed by vermin before 1775, but the other leg and the head are preserved to this day in the Ashmolean Museum. Here also is a large drawing of a dodo, taken from nature, by John Savery: it is important, on account of the feathers, wings, and tail; below it are a frog and a few cryptogamous plants, thought by some to have been the food of the bird; but others suppose it to have fed upon the cocoa-nuts, mangos, and other fruits which, in tropical forests, fall from the trees at all seasons of the year. The Oxford head and foot have been dissected, proving the dodo to have been not related to the gallinaceous birds, the ostriches, or the vultures, as many had supposed; but to have been closely allied to the pigeons, and the solitaire bird seen by Leguat in the Island of Rodrigeux in 1691. Others maintain that the dodo was evidently not a frugivorous bird, as when first taken its flesh was strong and uneatable; it was therefore believed to have been a bird *sui generis*.

There exist four oil-paintings of the dodo: one in the British Museum, without the artist's name; one at the Hague; another at Berlin, by Roland Savery; and one at Oxford, by John Savery, his nephew. All these are evidently from one original, thought to be the dodo brought by Van Neck to Holland. There is a fourth picture in the possession of the Duke of Northumberland, at Syon House: it appears to have been painted by Dee Heem and Jean Goimare, in 1627. Mr. Broderip has also a picture of the bird. The figure so often copied from Sloane's drawings in the British Museum, for works on natural history, is not thought to have been taken from nature.—See the beautifully-illustrated Monograph, "The Dodo and its Kindred," by Strickland and Melville. There is also a head of the bird at Copenhagen.

FISHES BUILDING NESTS.

Professor Agassiz, while collecting insects along the shores of Lake Sebago, in Maine, observed a couple of cat-fish, which, at his approach, left the shore suddenly, and returned to the deeper water. Examining the place which the fishes had left, he discovered a nest among the water-plants with a number of little tadpoles. In a few moments the two fishes returned, looking anxiously towards the nest, and approached within six or eight feet of where Professor Agassiz stood.

VOICE OF FISH.

It has often been said that fish have no voices; but anglers of our time have proved that tench croak like frogs; herrings cry like mice; gurnards grunt like hogs; and some say the gurnard makes a noise like a cuckoo, from which he takes

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one of his country names. The maigre, a large sea-fish, when swimming in shoals, utters a grunting or piercing noise that may be heard from a depth of twenty fathoms.

A WONDERFUL FISH.

The Bohemians have a proverb, "every fish has another for prey;" the Wels (*Silurus*) has them all. This is the largest fresh-water fish found in the rivers of Europe, except the sturgeon; it often reaches five or six feet in length. It destroys many aquatic birds, and we are assured that it does not spare the human species. On the 3d of July 1700, a peasant took one near Thorn that had an infant entire in its stomach! They tell in Hungary of children and young girls being devoured on going to draw water; and they even relate that on the frontiers of Turkey a poor fisherman took one that had in its stomach the body of a woman, her purse full of gold and a *ring*. The fish is even reputed to have been taken sixteen feet long: but we place all these exaggerations along with Gesner's well-known story of the pike nineteen feet long and 267 years old.

SPORTING FISH.

We have a curious instance of the precision of the eye, and of the adaptation of muscular action, in the *Chætodon rostratus*, a fish which inhabits the Indian rivers, and lives on the smaller aquatic flies. When it observes one alighted upon a twig, or flying over (for it can shoot them on the wing), it darts a drop of water with so steady an aim as to bring the fly down into the water, when it falls an easy prey: it will hit a fly at the distance of from three to six feet. Another fish of the same order, the *Zeus insidiator*, has the power of forming its mouth into a tube, and squirting at flies, so as to encumber their wings and bring them to the surface of the water. In these instances, a difficulty will readily occur to the reader. How does the fish judge of position, since the rays of light are refracted at the surface of the water? Does instinct enable it to do this, or is it by experience?—*Sir Charles Bell, on the Hand.*

GENERATION OF THE EEL.

This *quæstio vexata*, which occupied the attention of naturalists from Aristotle downwards, was at last set at rest by Mr. Yarrell* proving by minute and microscopic dissections carried on through eighteen months in succession, that the Eel is oviparous, having milt and roe like other fishes. Mr. Yarrell traced eels down to the brackish water, whither they go generally, though not universally, to deposit their spawn; and he

* Assisted by Dr. W. Roots, F.S.A., Mr. Jesse, and the late Mr. Bransby Cooper, F.R.S.

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followed the young in their extraordinary spring journeys up the great rivers, and into the brooks and rivulets, in which they seek out for themselves haunts. In numbers they are immeasurable; the shoals advance up the stream, forming a black line along the shore; nor are these journeys confined to the water—they cross fields, and climb posts and pales, in order to reach the place of their destination.

INK OF THE CUTTLE-FISH.

There is a popular notion that the Cuttle-fish, when in danger, has the power of ejecting a copious black liquid through its excrementary canal, so as to darken the water and conceal the fish from its pursuers; but Sir Everard Home has shown this secretion to answer a purpose in the animal economy connected with the functions of the intestines. (*Lect. Comp. Anat.* vol. i. p. 376.) Dr. Coldstream, who kept a cuttle-fish, never saw the ink ejected, however much the animal might be irritated; but he was told by fishermen that the fish ejects the black liquid with great force when just taken from the sea.

According to Cuvier, the "Indian Ink" brought from China is made from the liquor of cuttle-fish, which in the China seas abound of gigantic size. Dr. Shaw supposed the celebrated plain but wholesome dish, the black broth of Sparta, to be no other than a kind of cuttle-fish soup, in which the black liquor of the animal was added as an ingredient: when fresh, it is of very agreeable flavour.

ISINGLASS

is corrupted from the Dutch *huzenblas*, an air-bladder, compounded of *huzen*, to hoist, and *blas*, a bladder; it being chiefly prepared from the sounds, swimms, or bladders, of sturgeon.—*Booth's Analytical Dictionary.*

HOW ARTIFICIAL PEARLS ARE FORMED.

Sir Joseph Banks was the first naturalist who described the manner in which Pearls are formed by certain testaceous animals in their shells; but his narrative was generally questioned. It was, however, fully corroborated in 1853, when the *Hermes* steamer, being at Ningpo, the great Chinese market for these pearls, the sailors obtained some live mussels, in which, on being opened, several pearls were found in the course of formation. It appears that the Chinese introduce pieces of wood or baked earth into the live mussel, which, being irritated, covers the substance with a pearly deposit. Little metal figures, generally of Buddha, are frequently introduced, and when thus coated with pearl are valued as charms.

Artificial pearls have been made from the scales of the

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bleak, and other fish, since the reign of Henry IV. of France; the beads are of glass, and are coated inside with the pearl essence; and the taking of the fish and the manufacture of the pearl and beads is said to employ 100,000 persons in France and Switzerland.

Pearls, from their consisting of carbonate of lime, are, of course, very soluble in acids. Hence may have originated the account of Cleopatra dissolving a pearl in vinegar, and drinking it to Mark Antony's health at supper; which is now regarded as an historical fiction, to show the inventive talents of the voluptuous queen in her allurements for Antony, in whom she found a companion to her taste. It is, however, pretty certain that Cleopatra possessed a pearl, or pearls, of great value.

BARNACLES.

The popular errors about Barnacles are thus told. Baptista Porta, who died in 1515, in his *Natural Magic* says:

"Late writers report, that not only in Scotland, but also in the river of Thames by London, there is a kind of shell-fish in a two-leaved shell that hath a foot full of plaits and wrinkles. * * They commonly stick in the keel of some old ship. Some say they come of worms, some of the boughs of trees which fall into the sea; if any of them be cast upon shore, they die; but they which are swallowed still into the sea, live and get out of their shells, and grow to be ducks or such-like birds."

We find this illustration in *Hudibras:*

"As barnacles turn Poland geese
In th' islands of the Orcades."

This story originated in the peculiar formation of the little mollusk which inhabits the multivalve shell, the *Pentalasmis anatifera*, which by a fleshy peduncle attaches itself by one end to the bottoms of ships or floating timber, whilst from the other there protrudes a bunch of curling and fringe-like cirrhi, by the agitation of which it attracts and collects its food. These cirrhi so much resemble feathers, as to have suggested the leading idea of a bird's tail; and hence the construction of the remainder of the fable, which Gerarde gravely records in his *Herbal*, 1597, describing the bird as "bigger than a mallard, and lesser than a goose, called by the Lancashire people a tree-goose;" and Gerarde says elsewhere, that "in the north parts of Scotland, and the islands called Orcades," there are certain trees whereon these tree-geese and barnacles abound.

Drayton (1613), in his *Poly-olbion*, iii., in connection with the river Lee, speaks of

"Th' anatomised fish and fowls from planchers sprung;"

to which a note is appended in Southey's edition, p. 609, that such fowls were "barnacles, a bird breeding upon old ships." A bunch of the shells attached to a ship, or to a piece of floating timber, at a distance appears like flowers in bloom; the foot of the animal has a similitude to the stalk of a plant growing from the ship's sides, the shell resembles a calyx, and the flower consists of the tentacula, or fingers, of the shell-fish. The ancient error was to mistake the foot for the neck of a goose,

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the shell for its head, and the tentacula for feathers. As to the body, *non est inventus.* The barnacle-goose is a well-known bird, and is eaten on fast-days in France, by virtue of this old belief in its marine origin.

Sir Kenelm Digby was soundly laughed at for relating to a party at the castle of the Governor of Calais that "the barnacle, a bird in Jersey, was first a shell-fish to appearance, and, from that striking upon old wood, became in time a bird." In 1807, there was exhibited in Spring-gardens, London, a "Wonderful natural curiosity, called the Goose Tree, Barnacle Tree, or Tree bearing Geese," taken up at sea on January 12th, and more than twenty men could raise out of the water.—*Notes and Queries*, No. 201.

Sir J. Emerson Tennent asks whether the ready acceptance and general credence given to so obvious a fable may not have been derived from giving too literal a construction to the text of the passage in the first chapter of Genesis:

"And God said, Let the *waters bring forth abundantly* the moving creature that hath life, and the *fowl* that may fly in the open firmament of heaven."

The earliest account of the barnacle is that given by Giraldus Cambrensis (12th century), in his *Topographia Hiberniæ.* The belief in the barnacle origin of the bird still prevails on the west coast of Ireland, and in the Western Highlands of Scotland.

PHOSPHORESCENCE OF THE SEA.

Dr. Pœppig, in his voyage to Chile, saw from the topmast a dark red streak, estimated at six English miles broad; then the colour changed to the brilliant purple, and the foam at the ship's stern was roseate. The water taken up in a bucket appeared transparent; but a moderate magnifying-glass showed little red dots, consisting of infusoria of spherical form, but destitute of external organs of motion. The ship sailed for four hours through this streak, the superficies of which must have been 168 English square miles; and if we add that the infusoria may have been equally distributed in the water to the depth of six feet, their numbers surpass the conception of the human understanding.

CAN TOADS LIVE ENCLOSED IN STONE OR WOOD?

The Revs. Dr. Buckland and E. Stanley, from a variety of experiments to determine the possibility of these reptiles existing within blocks of stone or wood, conclude that the commonly received belief is perfectly false; notwithstanding the almost numberless instances on record, apparently well attested, of the vitality of the reptiles under the joint additional singularity of exclusion of air and privation of food. See Jameson's *Journal*, Nos. 25 and 26.

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EATABLE FROGS.

Frogs live on land the greater part of the year, and do not retire to the water till the cold nights of October, when they retreat for the winter to the bottom of stagnant pools. They arrive at full age in about five years, and are supposed to live about twelve or fifteen. They are so tenacious of life, that they will continue to live, and even jump about, several hours after their heads have been cut off. The *hind legs* of frogs are fricasseed, and their fore legs and liver are put into soup, on the Continent. The edible frog is considerably larger than the common frog, and though rare in England, is common in Italy, France, and Germany; they are brought from the country to Vienna, 3000 or 4000 at a time, and are sold to the great dealers, who have conservatories for them. They are caught at night by means of lights and nets, or hooks baited with worms; in Switzerland, by long rakes, with dove-set teeth, which are thrown into the water, and drawn suddenly out again. Some persons have kept frogs as pets: Dr. Townson kept one he called "Musidora," to guard his dessert from flies.—*Proceedings of the Ashmolean Society.*

THE RATTLESNAKE.

The Rattlesnake, although its poison is so fatal, is, in fact, not a very dangerous animal, and people are seldom bitten by it. This arises from two causes: first, that it invariably gives you notice of its presence by its rattle; and secondly, that it always coils itself up like a watch-spring before it strikes, and then darts forward only about its own length. Where Rattlesnakes are common, as in Wisconsin, persons generally carry with them a vial of ammonia, which, if instantly applied to the bite, will at least prevent death.—*Capt. Marryat.*

THE SALAMANDER.

The proven popular error that the Salamander has the power of resisting the effects of fire led to the denial of its existence; but there are five species of salamanders ascertained in England, and Siebold describes a species in Japan as large as a man! Two new species were being brought to Europe; but the male ate up his wife in the tub on their voyage!*

RATE AT WHICH THE WINGS OF INSECTS MOVE.

The buzzing and humming noises produced by winged insects are not, as might be supposed, vocal sounds. They

* The Salamander was the emblem of Francis I., and may be seen sculptured upon his château of Chambord upon the Loire. The accompanying device, *Nutrisco et extinguo*, is indicated by the Italian legend upon a medal struck during the youth of Francis: *Nudrisco il buono e spengo il reo*—I nourish the good, and extinguish the bad; or, I raise up the good, and cast down the wicked.

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result from sonorous undulations imparted to the air by the flapping of their wings. This may be rendered evident by observing that the noise always ceases when the insect alights on any object. The sirene has been ingeniously applied for the purpose of ascertaining the rate at which the wings of such creatures flap. This instrument being brought into unison with the sound produced by the insect, indicates, as in the case of any other musical sound, the rate of vibration. In this way it has been ascertained that the wings of a gnat flap at the rate of 15,000 times per second. The pitch of the note produced by this insect in the act of flying is, therefore, more than two octaves above the highest note of a seven-octave pianoforte. The wings of some insects are so thin, that 50,000 placed one upon the other would not form a heap of more than a quarter of an inch in height!—*Lardner's Handbook.*

FLIES WALKING UP GLASS.

In 1832 Mr. Blackwell read to the Linnæan Society certain facts discordant with Sir E. Home's opinion, that flies walk up glass by means of a vacuum produced in their foot, on the principle of the boy's leather sucker. Mr. Blackwell's views closely corresponded to the following, anticipated by Dr. Power nearly 200 years previously, who then referred this power principally to "a furry kinde of substance like little sponges, with which she hath lined the soles of her feet, which substance is also repleated with a whitish viscous liquor, which she can at pleasure squeeze out, and so sodder and beglue herself to the plaice she walks on, which otherwise her gravity would hinder (were it not for this contrivance), especially when she walks in those inverted positions."

STATISTICS OF SILKWORMS.

24,000 eggs of the silkworm weigh a quarter of an ounce; the worm lives from 45 to 53 days; it increases in weight in 30 days 9,500 fold, and during the last 28 days of its life eats nothing. For 739 lbs. of mulberry-leaves, 70 lbs. of cocoons are obtained; 100 lbs. of cocoons give 8½ lbs. of spun silk; and one pound of cocoons will produce a single thread of 88,000 fathoms in length.—*Berger.*

THE CELL OF THE BEE.

When we behold the Bee constructing its cell to contain its winter stock, and constructing it of that form which is demonstrably the strongest and the most convenient, it must be evident to every one who has given the least attention to the obvious properties of different figures, that there are only three which will admit the junction of their sides without any vacant

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spaces between them, all the figures being equal and similar; namely, the square, the equilateral triangle, and the hexaedron. Of these the last is the strongest and most convenient. In this form, then, we find that the cells are constructed. This is a wonderful fact: and what is equally remarkable, the middle of every cell, on one side, is directly opposite to the point where the three partitions meet on the opposite side. By this position the cell receives additional strength. This is not all. If human ingenuity were to contrive a cell which would require the least expenditure of material and labour, it would be a question, not easily solved, at what precise angle the three planes which compose the bottom ought to meet. Maclaurin, the celebrated mathematician, by a fluxionary calculus, determined precisely the angle required; and he found, by the most exact mensuration that the subject would admit, that it is the very angle in which the three planes in the bottom of the cell of a honeycomb do exactly meet. Again, Reaumur, presuming that the angles were adopted for the purpose of saving material, proposed to König, the mathematician, that he should determine what should be the angles of a hexagonal cell, with a pyramidal base, to require the least material. By the infinitesimal calculus, he ascertained that the greatest angle should be 109° 26′, and the smaller 70° 34′, the very angles which the bee adopts. What an astonishing coincidence is this! A profound mathematician is required to solve a very difficult problem; and it is found that his conclusion, gained by the exercise of considerable ingenuity and deep thought, was practically exhibited in the operations of the bee.—*Crombie's Natural Theology.*

Kirby and Spence say that "Maraldi found that the great angles were generally 10° 28′, and the smaller ones 70° 32′, and Mr. König, an eminent mathematician, calculated that they ought to be 109° 26′, and 70° 34′, to obtain the greatest strength with any given amount of material." Lord Brougham states, that he has discovered that the bee is right, and that the mathematician was wrong; and that other mathematicians with whom he has communicated agree with him, and have detected the source of the error.

The habits of bees are extremely difficult to unravel, on account of their invariable determination to work in the dark. In all ages philosophers have devoted much time to the subject: from Aristomachus, of Soli, in Cilicia, who, we are told by Pliny, for fifty-eight years attended solely to bees; and Philiscus, the Thracian, who spent his whole time in forests, investigating the habits of bees,—to Swammerdam, Reaumur, Hunter, and Huber, in modern times. Still, the construction of a honeycomb is a miracle which overwhelms our faculties.—*Smee, on Instinct and Reason*, p. 163.

KEEPING FLIES OUT OF HOUSES.

In 1836 Mr. Spence communicated to the Transactions of the Entomological Society the means of excluding flies from

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a room with unclosed windows, by covering the openings of such windows with a net made of white or light-coloured thread, with meshes an inch or more in diameter. Now there was no physical obstacle whatever to the entrance of the flies, every separate mesh being, not merely large enough to admit one fly, but several, even with expanded wings, to pass through at the same moment; consequently both as to the free admission of air and of the flies, there was practically no greater impediment than if the windows were entirely open; the flies being excluded simply from some dread of venturing across this thread-work. The only condition is, that the light enter the room on one side only; for if there be a thorough light from an opposite window, the flies will *pass through the net.*

Mr. Spence first saw this mode practised near Florence by a gentleman who had seen it adopted in the monastery either of Camaldoli or La Verna. A passage in Herodotus, book ii. chap. 95, records that the fishermen in his time were similarly protected from gnats when asleep, by covering themselves with their casting-nets, through the meshes of which the gnats would not pass. Thus Herodotus is as correct in this passage as Geoffrey St. Hilaire showed him to be in the history of a bird (*Charadrius Egypticus* of Hasselquist) taking the gnats out of the mouth of the crocodile, which was deemed a mere fable until confirmed by the evidence of St. Hilaire when in Egypt.

LIGHT OF THE GLOW-WORM.

The common doctrine respecting the Light of the Glow-worm is, that it is a lamp lit up by the female to direct the darkling flight of the male. This proves to be a fallacy; for the grubs,—which, being in a state of infancy, are therefore incapable of propagating,—exhibit a no less brilliant light than the perfect insect. De Geer remarked the same light in the nymph state, which he describes as "very lively and brilliant;" and in this stage of existence it is still less capable of propagation than in that of larva. "Of what use, then," he asks, "is the light displayed by the glow-worm? It must serve some purpose yet unknown. The authors who have spoken of the male glow-worms say positively that they shine in the dark as well as the females." These plain facts appear completely to extinguish the poetical theory.

Mr. Waller, in the *Philosophical Transactions* for 1684, describes an English flying glow-worm, which he observed at Northam, in Hertfordshire, the light of which was so vivid as to be plainly perceived even when a candle was in the room.

The glow-worm possesses the curious property of causing its light to cease at will. Dr. Burmeister mentions the fact, that while catching some of the flying species of glow-worms in his hat, they have so suddenly and entirely ceased to shine, that he has fancied that they must have escaped. When disturbed, the insects emit a bright, but frequently interrupted,

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light; and when laid upon their backs they shine without intermission, in consequence of the continual motions in the endeavours of the insect to regain its position.—*Westwood's Classification of Insects.*

THE EARWIG.

This insect is doubtless named from its supposed fondness for getting into the human ear, the effect of which, it has been believed, is to penetrate the brain, and cause madness. Now, the earwig is not more likely than any other insect to enter the ear; and if it does so, the *membranum tympani*, the drum-head of the ear, will prevent the progress of the intruder, which may be killed or dislodged with ease by means of a few drops of oil. Now, as to the name of the earwig, its wings, when fully expanded, are in shape precisely like the human ear; from which circumstance, "it seems highly probable that the original name of this insect was ear-*wing*, and not ear-*wig*, which appears to be entirely without a meaning."—*Newman's Grammar of Entomology*, p. 65. The name is also traced to the Saxon *ear wigca*, from its destroying ears of grain and fruit.—*Thomson's Etymons of English Words.*

WHAT IS "RED SNOW"?

The accounts of Red Snow, in the Journals of Ross, Parry, and other Arctic voyagers, were at first received with some doubt; nor was the phenomenon rightly understood until the microscope had revealed its minute organism. M. Justice has by this means ascertained the Red Snow (*Protococcus nivalis*) to be a globular cyst, varying in size from the $\frac{1}{2500}$th of an inch to the $\frac{1}{1000}$th of an inch in diameter; each cell, or cyst, having an opening, whose smallest diameter measures only the $\frac{1}{5000}$th part of an inch. The "snow," when perfect, resembles the red currant of our gardens; as it decays, the red colouring-matter is lost, being gradually superseded by a deep orange, which finally appears to change into a brown, or the cell becomes transparent. In this transparent state, when the cell is broken, the thickness of the enveloping cuticle may be measured: this does not exceed the $\frac{1}{2000}$th part of an inch; and where the opening is preserved, the interior of it becomes of a delicate green colour.—*Proceedings of the American Philosophical Society*, 1854.

PLAGUES OF INSECTS.

It furnishes a subject of serious consideration, as well as an argument for a special providence, to know, that the accurate Reaumur and other naturalists have observed, that when any kind of insect has increased inordinately, its natural enemies have increased in the same proportion, and thus preserved the balance.

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Trees and Plants.

LEAVES OF TREES AND BOOKS.

The use of the *liber* or inner bark of trees among the ancients is well known. In the *Philosophical Trahsactions* Sir John Clerk says: "The most ancient sort of charta (or paper) was of the inner bark of trees, called *liber* in Latin, whence a book had the name of *liber;* but very little of this sort is now in being." Hence the term *leaf* was first applied to paper, from leaves, especially of palms, formerly used for writing on. Thus we as familiarly speak of the leaf of a book as the leaf of a tree.

WARDIAN CASES FOR PLANTS.

This ingenious adaptation originated with Mr. Ward, of Wellclose-square, who was led to employ these air-tight cases for the accommodation of his window-plants by the following circumstance. He had placed a chrysalis in a bottle with a little damp earth, to watch its progress towards transformation into a moth; when a fern and a grass began to vegetate, and continued to show a healthy appearance. Thus all the requirements of nature were contained within the bottle—air, light, and moisture. Many persons have fallen into the error that Ward's cases were, or ought to be, hermetically sealed; on the contrary, a change of air is frequently necessary; this will imperceptibly occur in the closest-made cases, or they would inevitably burst. The trough to contain the earth may be made of earthenware or wood pitched inside, but the best are zinc. Bell-glasses are preferable; they are also adapted for cut flowers, which are long preserved in them. To size there are no limits, from an ounce phial even to the Crystal Palace itself. The decay of a healthy plant on transmission to a room in town is effected by the variety of gases, evaporation from dryness of air, frequent and sudden alteration of temperature, deposition of dust, soot, &c., the latter especially inimical; all these are provided against by the glass-case, while the moisture which is raised becomes condensed on the sides of the glass on occasions of change in the external temperature, accumulating and descending to the earth at the bottom, becoming more perfectly aerated and in a state better adapted for nourishing the plant. So complete is the *routine* in such a little world, in itself inde-

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pendent of external circumstances, that the old bottle sealed up nineteen years since is green with vegetation, though the deposits of confervæ on the inner surface disfigure its appearance. This bottle has had no fresh moisture since first closed.

AGED TREES.

Baobab.—The traveller Adanson discovered in India a Baobab tree the trunk of which measured 78 feet in girth. As he could not cut a tree down every time he wished to ascertain its age, he measured it, and thus formed an approximation that baobabs exist for 5000 years (†).

The Camphor-tree, of Sorrogi, in Japan, is hollow, and will hold fifteen persons. Superstition relates that it grew from the staff of the philosopher Kobodarsi; and Siebold thinks the tree may have existed since the time of that sage, at the close of the eighth century.

The Chestnut-tree of Mount Etna, so famed by travellers, as 160 feet in circumference, is now believed to have been composed of several trunks united together.

The Spanish Chestnut-trees in Betchworth Park, near Dorking, Surrey, are thought to be coeval with the first Betchworth Castle, founded in 1377. But the celebrated chestnut-tree of Tortworth, in Gloucestershire, is said to have stood there since the reign of Stephen, 1150.

The Cypress of Soma, in Lombardy, is perhaps the oldest tree of which there is any record in the world. It is generally supposed to have been planted in the year of the birth of Christ; but the Abbé Belize states that there is extant at Milan a chronicle which proves that it was a tree in the time of Julius Cæsar, B.C. 42. It is 121 feet high.

The Dragon-tree of Orotava, in the Island of Teneriffe, is considered by Humboldt to be 1000 years old; it is stated to have been as large and as hollow in 1402 as it was found by Humboldt late in the last century.

The Eucalyptus, or Gum-tree, near the foot of Mount Wellington, in Tasmania, is stated to be 250 feet high; its diameter is fully 30 feet. This is reputed to be the largest, if not the oldest, tree in the world.

Oaks.—The Bull Oak, Wedgenock Park, the Cowthorpe Oak, and the Plestor Oak, Colborne, are believed to be as old as the time of imparking lands, after the Norman Conquest. There are Gospel Oaks, named from portions of the Gospel having been formerly read under their branches at boundary custom on Holy Thursday. Again, a group of twelve oaks has been called "The Twelve Apostles;" and of four, "The Four Evangelists." But the Winfarthing Oak and the Bentley Oak are believed to have been 700 years old at the time of the Conquest. William the

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Conqueror's Oak, in Windsor Great Park, measures, at 4 feet from the ground, 38 feet in girth, and is probably from 1000 to 1200 years old.

The Olive-tree at Pessio, the most ancient in Italy, is stated by Maschettini to be 700 years old; but in the environs of Nice is an olive-tree of much greater age.

During a period of little more than 2000 years, Hebrews, Assyrians, Romans, Moslems, and Christians have been successively in possession of the rocky mountains of Palestine; yet the olive still vindicates its paternal soil, and is found at this day upon the same spot which was called by the Hebrew writers *Mount Olivet* and the *Mount of Olives* eleven centuries before the Christian era.—*Dr. E. Clarke.*

Orange-trees.—In the Orangery at Versailles is a tree raised from seed sown in 1421. There is another in the yard of the convent of St. Sabina, at Rome, said to have been planted by St. Dominic in 1200. In the neighbourhood of Finale is an orange-tree which bears nearly 8000 oranges in a single year.—*Berthollet.* There are in Holland many orange-trees which have been in the same family 200 and 300 years; one at Versailles has the inscription, "*Semé en* 1421."

Wellingtonia Gigantea is the coniferous monarch of the Californian forest; it inhabits a solitary district on the elevated slopes of the Sierra Nevada, at 5000 feet above the sea-level. From 80 to 90 trees exist, all within the circuit of a mile, and these varying from 250 to 320 feet in height, and from 10 to 20 feet in diameter. The bark is from 12 to 15 inches in thickness; the branchlets are somewhat pendent, and resemble those of cypress or juniper, and it has the cones of a pine. Of a tree felled in 1853, 21 feet of the bark from the lower part of the trunk were put in the natural form as a room, which would contain a piano with seats for forty persons; and on one occasion 150 children were admitted. This bark room was exhibited in London in 1856. The tree is reputed to have been above 3000 years old; that is to say, it must have been a little plant when Samson was slaying the Philistines, or Paris running away with Helen, or Æneas carrying off *pater Anchises* upon his filial shoulders; "and this," says the Editor of *The Gardeners' Chronicle*, "may very well be true, if the tree does not grow above two inches in diameter in twenty years, which we believe to be the fact."

Yew-trees.—Mr. Bowman, F.L.S., as the result of his observations upon the growth of several young yew-trees, concludes that their diameters increase during the first 120 years at the rate of one-sixth of an inch per annum. In Gresford churchyard, near Wrexham, North Wales, eighteen yew-trees, recorded in the parish register to have been planted in 1726, averaged 20 inches diameter in 1836. Another yew-tree in the same church-

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yard had a trunk 22 feet in circumference at the base and 29 feet below the first branches, giving a mean diameter of 1224 lines, which, according to De Candolle's calculation, ought also to indicate the number of years. From three sections of this tree Mr. Bowman found the average of rings deposited for one inch in depth of its latest growth to be 34¾; comparing which with the data of the eighteen young trees, the probable age of this tree was 1419 years. Another yew-tree, in Darley churchyard, Derbyshire, had a mean diameter of 1356 lines; horizontal sections gave an average for its latest increase at 44 rings per inch nearly, which gives 2006 years as its age.—*Proc. British Assoc.*, 1836.

The Ankerwyke Yew was a vigorous tree on the bank of the Thames opposite Runnymede, in Surrey, when Magna Charta was signed there in 1215; and this tree still bears to this day its green leaf after 650 winters.

THE WOOD OF THE CROSS.

The Cross was generally supposed to have been made of four kinds of wood, signifying the four quarters of the globe, or all mankind; it is not, however, agreed what those four kinds were, or their respective places in the cross. Some say the four incorruptible woods were the palm, the cedar, the olive, and the cypress; hence the line,

"Ligna crucis palma, cedrus, cupressus, oliva."

Instead of the palm and the olive, some claim the honour for the pine and the box; whilst others say it was made entirely of oak. (See Barradius, *in loco;* Southey's *Commonplace Book*, second series, p. 382; and his *Omniana,* "The Tree of Life," p. 276.) In Curzon's *Monasteries of the Levant,* we are told that the cedar was cut down by Solomon, and buried on the spot afterwards called the pool of Bethesda; that about the time of the passion of our Blessed Lord the wood floated, and was used by the Jews for the upright parts of the cross.

Amongst the titles of honour given to the Blessed Virgin in the "Ballad in commendation of our Lady," in the old editions of Chaucer, we find,

"Benigne braunchlet of the *pine tree.*" (*Notes and Queries,* No. 300.)

Another account states the wood to have been the aspen, since which its leaves have never ceased trembling.

It was once believed in Scotland that the dwarf birch is stunted in growth because the rods were formed of it with which Christ was scourged.

The Head, the Hope, the Supporter of those who gave their bodies to be burnt, drank himself of a bitter cup. Of all the devices of cruel imaginations, Crucifixion is the master-piece. Other pains are sharper

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for a time, but none are at once so agonising and so long. One aggravation, however, was wanting, which, owing to the want of knowledge in painters, is still, we believe, commonly supposed to have belonged to the punishment. The weight of the body was borne by a ledge which projected from the middle of the upright beam, and not by the hands and feet, which were probably found unequal to the strain. The frailty of man's frame comes at last to be its own defence; but enough remained to preserve the pre-eminence of torture to the cross. The process of nailing was exquisite torment, and yet worse in what ensued than in the actual infliction. The spikes wrankled, the wounds inflamed, the local injury produced a general fever, the fever a most intolerable thirst; but the misery of miseries to the sufferer was, while racked with agony, to be fastened in a position which did not permit him even to writhe. Every attempt to relieve the muscles, every instinctive movement of anguish, only served to drag the lacerated flesh, and wake up new and acuter pangs; and this torture, which must have been continually aggravated until advancing death began to lay it to sleep, lasted on an average two or three days.—*Quarterly Review.* With these harrowing details in the mind's eye, a painting of the Crucifixion is sometimes viewed as a representation of physical suffering; but the Christian regards it as "the universal frame of nature giving testimony to Christ's divinity."

"JUDAS'S TREE."

The elder has been supposed by some to be the tree on which Judas hanged himself, thus:

> "Judas he japed
> With Jewen silver,
> And sithen *on an eller*
> Hanged hymselve." *Piers Plowman's Vision*, 593-6.

According to others it was a fig-tree.

MANIFOLD USES OF THE BAMBOO.

No plant in Bengal is applied to such a variety of useful purposes as the Bamboo. Of it are made implements for weaving; the posts and frames of the roofs of huts; scaffoldings for buildings; portable stages for natives' processions; raised floors for granaries; stakes for nets in rivers; rafts, masts, yards, oars, spars, and decks of boats. It is used for building bridges across creeks; for fences; as a lever for raising water for irrigation; and as flag-poles. Several agricultural implements are made of it; as are also hackeries or carts, doolees or litters, and biers; the shafts of javelins or spears, bows and arrows, clubs, and fishing-rods. A joint of bamboo serves as a holder for pens, small instruments, and tools. It is used as a case in which things of little bulk are sent to a distance: the eggs of silkworms were brought in a bamboo-cane from China to Constantinople, in the time of Justinian. A joint of bamboo answers the purpose of a bottle; and a section of it is a measure for liquids in bazaars. A piece of it is used as a blow-pipe, and as a tube in a distilling apparatus. A small bit

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of it, split at one end, serves as tongs to take up burning charcoal; and a thin slip of it is sharp enough to be used as a knife in shelling betel-nuts, &c. Its surface is so hard, that it answers the purpose of a whetstone, upon which the ryots sharpen their bill-hooks, sickles, &c. Its growth is rapid: Dr. John Davy has known a bamboo to shoot fourteen inches in twenty-four hours.

THE COW-TREE OF SOUTH AMERICA.

The *Palo de Vaca*, or Cow-tree, whether considered in reference to its milk, or rather *cream*, or its bark, affords phenomena among the wonders of vegetation. Both the milk and bark contain the elements of nutritious and wholesome food for man; and bread formed of its bark would be almost equal to the *cerealia*, or that made from corn—the finest of the wheat; for the immediate or proximate parts of wheaten flour are found in the bark of the cow-tree; so that the *Palo de Vaca* yields both bread and milk.—*John Murray, F.L.S.*

THE UPAS TREE OF JAVA,

of the poison of which so many fabulous stories have been reported, is now growing in the Horticultural Society's Garden at Chiswick; notwithstanding the fables of Dutch travellers, perpetuated by Darwin, it may be approached with safety. It is, however, so virulent a poison, that no prudent person would handle it without proper precaution. "The Strychnos Tienté is the plant which yields the Upas Tienté, one of the Javanese poisons. It has been analysed, and found to contain strychnia, and to be almost as energetic as strychnia itself. Dr. Darwin has given an account of its effects on the Javanese criminals, who used formerly to be executed by darts poisoned with the tienté. I believe the account is not very authentic; yet it accords precisely with what would be expected from the known properties of the poison." (*Christison, on Poisons.*) The Upas Antiar is another Javanese poison, a bitter milky juice, which acts violently on the heart.

THE COCOA-NUT.

In this fruit we find a refreshing beverage, in a cool limpid state, in a nutritious pulp of the consistence of blanc-mange, and as agreeable to the taste. In a young nut the fluid exceeds half-a-pint; and the living pulp makes an emulsion equal to that of the almond, which is an excellent substitute for milk in tea. The Cocoa-nut palm thrives best by the seaside, it flourishes even within high-water mark; as if designed by a kind Providence to yield a drink in situations in which springs of fresh and wholesome water are not often to be found. In Ceylon

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the natives put a portion of salt into the ground when they plant the nut, so convinced are they that salt is required for its successful growth.

COTTON.

The word *Cotton* has been adopted in modern European languages from the Arabic word meaning the same article, and which, when put into English letters, would be pronounced *kotun;* in Egypt it is called *gotun*. The Spanish word *algodon* is evidently the Egypto-Arabic word, with the *al* prefixed. The Germans, who generally avoid intercalating into their language words of foreign origin, call it *baum-wolle*, *i.e.* tree-wool. —*Arthur Aikin.*

NANKIN COTTON.

The yellowish-brown colour of Chinese nankins is the natural tint of the cotton, and is not imparted by dyeing. The name is derived from the city of Nankin, to which place the manufacture of these cotton-stuffs was once peculiar.

THE BREAD-FRUIT TREE AND THE ALOE.

The Rev. Mr. Gill has communicated to *Jameson's Journal*, No. 113, the interesting botanical fact that, during a recent missionary visit to one of the Lamoa Islands the chief of a tribe related, that a Bread-fruit tree having been found in a state of decay, the owner planted an Aloe near its roots, the influence of which in a very short time checked the decay, and caused it to revive, to flourish, and to bring forth fruit.

THE CLOVE

is the unexpanded flower-bud of the *Caryophyllus aromaticus*. It has been brought into the European market for more than 2000 years. The plant is a native of the Moluccas and other islands in the Chinese seas. "A fine tree has been known to yield 125 lbs. of this spice in a single season; and as 5000 cloves only weigh one pound, there must, at least, have been 625,000 flowers upon this single tree."—*Burnett.* In Amboyna the average crop may be reckoned at 250,000 or 300,000 lbs.

TOBACCO.

Forty different species of Tobacco are described by botanists, and prices range from 4*d.* per lb. for Canada to 3*s.* 6*d.* per lb. for best Havannah. It was introduced into France by Nicot in 1560, and into England by Sir Walter Raleigh in 1586.

John Aubrey tells us "Sir Walter Long, who was intimate with Sir Walter Raleigh, was the first who brought the use of tobacco into the northern parts of Wiltshire. In these days, they (meaning the gentlemen) had silver pipes. The ordinary sort made use of a walnut-shell

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and a strawe. I have heard my grandfather Lyte say, one pipe was handed from man to man round the table. Within these 35 years 'twas scandalous for a divine to take tobacco. It was sold then for its wayte in silver. I have heard some of our old yeoman neighbours say, that when they went to Malmesbury or Chippenham, they culled their biggest shillings to lay in the scales against the tobacco."

It would appear, by King James's celebrated *Counterblast*, that in the short space of thirty years the practice of smoking had become surprisingly common in this country, and that large sums were expended upon it, some lavishing three and some four hundred pounds per annum upon this "precious stinke," which his Majesty grotesquely stigmatises as "a custome loathsome to the eye, hateful to the nose, harmfull to the braine, dangerous to the lungs, and in the blacke stinking fume thereof neerest resembling the horrible Stigian smoake of the pit that is bottomlesse." Notwithstanding the *Counterblast*, the consumption in England went on increasing; and probably tobacco is now, next to salt, the vegetable product most generally consumed by man, there being no climate in which it is not used, no nationality which has not adopted it. The total annual production is estimated at 2,000,000 of *tons*, and would require half the British tonnage which "enters inwards" or "clears outwards" annually to transport the same. The value at 2*d.* per lb. would amount to 37,000,000*l.* sterling.

The comparative magnitude of this 2,000,000 tons will strike the reader more forcibly when we state that the whole of the wheat consumed by the inhabitants of Great Britain—estimating it at a quarter per head, or in round numbers at 20,000,000 quarters—weighs only four and one-third millions of tons; so that the tobacco yearly raised for the gratification of this one form of the narcotic appetite weighs as much as the wheat consumed by 10,000,000 Englishmen. And reckoning it at only double the market-value of wheat, or 2*d.* and a fraction per pound, it is worth in money as much as all the wheat eaten in Great Britain.—*Prof. Johnston; Blackwood's Edin. Magazine.*

THE LOTUS OF THE ANCIENTS

is believed to be the *Nitraria tridentata* of Desfontaines, which grows in the desert of Soussa, near Tunis. It is called Damouch by the Arabs, who are aware of the semi-intoxicating qualities of its berry, much more likely to give rise to the fame of the Lotus than the dry and unpleasant fruit of the *Zizyphus Lotos*, or that of the *Celtis australis*, to which the infatuating food of the *Lotophagi* has been in turn referred.—*Annals of Natural History*, 1847.

THE HYSSOP OF SCRIPTURE.

Dr. Royle, F.A.S., after an elaborate investigation of the

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speculations of various writers on this subject, concludes the Hyssop to be the caper-tree, the *Capparis spinosa* of Linnæus, which is abundant in the south of Europe, on the islands and coasts of the Mediterranean, in Lower Egypt, and in Syria.

ACONITE

was regarded by the ancients as the most violent of all poisons: hence they fabled it to be the invention of Hecate, and sprung from the foam of Cerberus. Persons, only by smelling the full-blown flower, are said to have been seized with swooning-fits, and to have lost their sight for two or three days; and a criminal has been put to death by swallowing a dram of the aconite-root.

Several fatal cases of poisoning have occurred by the accidental substitution of Aconite Root, or Monkshood (*Aconitum napellus*), for Horse-radish; but the roots of the two plants, instead of resembling each other, have scarcely any appearance in common. The only resemblance is in the crowns: thus Monkshood is conical in form, and tapers imperceptibly to a point; whilst Horse-radish is slightly conical at the crown, then cylindrical, or nearly so, and almost the same thickness for many inches. Monkshood is coffee-coloured externally; Horse-radish is white, with a yellow tinge. Monkshood is named from the resemblance of its flower to the hood of a monk.

THE MANDRAKE

is named from the German *mandragen*, resembling man, its forked root being like the lower half of the human figure; and if the plant be pulled when the fruit is ripe, one of the berries may be supposed to represent the head, and complete the figure.

> "Mark how that rooted mandrake wears
> His human feet, his human hands."—*Langhorne's Beeflower.*

It was once believed that the person who pulled up a mandrake would instantaneously fall dead; that the root shrieked or groaned when separated from the earth; and that whoever heard the shriek died shortly after, or became afflicted with madness: or,

> "Torn out of the earth,
> That living mortals, hearing them, run mad."
> *Romeo and Juliet.*
>
> "Would curses kill, as doth the bitter mandrake's groan."
> *Henry VI.* part ii.

Still, if the root were once dislodged, it became the good genius of its possessor. This was done by fastening the tail of a dog by cords to the bottom of the stem, and then the animal was whipped until, by its struggles, the plant was dragged up; the persons who directed the operation having their ears stopped with pitch, lest they should hear the fatal groan. The dog, *of course*, fell dead at the time, or soon after. The mandrake is

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believed to be the *duadim* of the Hebrews, the plant so coveted by Rachel in Scripture. Sir Thomas Browne has a chapter upon this question:—*Vulgar and Common Errors*, book vii.

SAGO PLANTS.

Sago, in the dialect of Amboyna, signifies meal; it is the pith of a species of palm, a single trunk of which will sometimes produce 600 lbs. The Javanese have a plant called the cycas, of which they eat the fruits, and extract from the trunk a kind of sago, which is so highly esteemed by persons of rank, that the plant is forbidden to be exported. A very small quantity of this pith satisfies the hunger of a Javanese soldier in war. A fine cycas may be seen in the great palm-house in Kew Gardens. Tapioca and cassava are a starch, nearly allied to sago, prepared from the American *Jatropha manihoc;* the milky juice is poisonous, but the starch which it deposits is harmless.

THE HOP PILLOW

was formerly a popular application to produce sleep; one of the most active ingredients of the hop being its narcotic essential oil, which gives the flower its peculiar smell. The hop pillow was employed by George III., and doubtless often relieved the sufferings of the sleepless monarch.

INTRODUCTION OF THE POTATO.

The history of the Potato affords a strong illustration of the influence of authority. For more than two centuries the use of this invaluable plant was vehemently opposed; at last, Louis XV. wore a bunch of its flowers in the midst of his courtiers, and the consumption of the root became universal in France.

THE POTATO DISEASE.

The Disease which has of late years appeared among Potato-plants, causing the tubers to rot and decay, was at first considered to be a totally new malady; but it has been proved to be the attack of aphides, long since recorded. In the *Annual Register* for 1805, in an article upon the aphis, it is stated that "in some years the aphides are so numerous as to cause almost a total failure of the hop and *potato* plantations; in other years the peas are equally injured, while exotics raised in stoves and greenhouses are frequently destroyed by their depredations."

THE PEA.

The Field Pea was probably introduced into this country by the Romans. Garden peas were a rarity in the time of Queen Elizabeth: they were brought from Holland, and were

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said by Fuller to be "fit dainties for ladies, they came so far and cost so dear."

Peas were formerly common on June 4, "the old King's Birthday."—(*Cobbett.*) The Editor of Pennant's *London*, fifth edition, states, that when he visited Goldsmiths' Hall, in 1812, the Company were disappointed (on account of the backwardness of the season) of their customary supply of fifty-two quarts of green peas, for their Restoration-Dinner, on May 29; for which five guineas per quart had been offered.

THE JERUSALEM ARTICHOKE

is corrupted from the Italian name *Girasole Articiocco*, sunflower artichoke, as the plant was first brought from Peru to Italy, and thence propagated throughout Europe.—*Sir J. E. Smith.*

VARIETIES OF IVY.

Mr. Gilbert Burnett says: The Ivy, in its infant or very young state, has stalks trailing upon the ground, and protruding rootlets through their whole extent; it is spear-leaved, and it bears neither flower nor fruit: this is termed, *Ivy creeping on the ground.* The same plant, when more advanced, quits the ground, and climbs walls and trees, its rootlets being holdfasts only; its leaves are generally three or five-lobed, and it is still barren: this is the *greater barren Ivy.* In its next or more mature state it disdains all props, and rising by its own strength above the walls on which it grew, occasionally puts on the appearance of a tree: in this, the flower of its age, the branches are smooth, devoid of radicles or holdfasts, and it is loaded with blossoms and fruit; the lobulations of the leaves are likewise less: this is the *war-poet's Ivy.* But when old, the ivy again becomes barren, again the suckers appear upon the stem, and the leaves are no longer lobed, but egg-shaped: this is the *Bacchanalian Ivy.*

Of the ivy Kennett (*Glossary*) tells us—

The booths in fairs were commonly drest with ivy-leaves, as a token of wine there sold, the ivy being sacred to Bacchus; so was the tavern-bush, or frame of wood, drest round with ivy forty years since, though now left off for tuns or barrels hung in the middle of it. This custom gave birth to the present practice of putting out a green bush at the door of those private houses which sell drink during the fair; and perhaps this is all the meaning of hanging out the broom when the wife is absent, and the husband left at liberty to entertain his friends.

CURIOSITIES OF GARDENING.

Gardening, as well as literature, has its "Curiosities," and a volume might be filled with them. How wonderful, for instance, the sensitive plant, which shrinks from the hand of man; the ice-plant, that almost cools one by looking at it; the pitcher-plant, with its welcome draught; the hair-trigger

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of the stylidium; and, most singular of all, the carnivorous "Venus's fly-trap" (*Dionæa muscipula*)—

"Only think of a vegetable being carnivorous!"—

which is said to bait its prickles with something which attracts the flies, upon whom it then closes, and whose decay is supposed to afford food for the plant. Disease is turned into beauty in the common and crested moss-rose, and a *lusus naturæ* reproduced in the hen-and-chicken daisy. There are phosphorescent plants, the fire-flies and glow-worms of the vegetable kingdom. There are the microscopic lichens and mosses; and there is the *Rafflesia Arnoldi*, each of whose petals is a foot long, its nectary a foot in diameter, and deep enough to contain three gallons, and weighing fifteen pounds! Again, the *Victoria Regia* lily, from British Guiana, has a flower three feet six inches in circumference; one of the leaves of the plant has borne a little girl in safety on the water for some time; a leaf five feet in diameter has grown in five days; and from the natural engineering of the under-side of the flower-leaf Sir Joseph Paxton devised the self-supporting principle which he applied in the roof of the Great Exhibition building in Hyde Park.

What mimicry is there in the orchises, and the hare's-foot fern, and the Tartarian lamb (*Polypodium Baronyetz*)! What shall we say to Gerarde's Barnacle-tree? (see page 87.) What monsters (such at least they are called by botanists) has art produced in doubling flowers, in dwarfing, and hybridising; "painting the lily," for there are pink (!) lilies of the valley, and pink violets, and yellow roses, and blue hydrangeas; and many are now busy in seeking that "philosopher's stone of gardening" the blue dahlia,—a useless search, if it be true that there is no instance of a yellow and blue variety in the same species.*—*De Candolle.* Foreigners turn to good account this foolish rage of ours for every thing novel and monstrous and unnatural, more worthy of Japan and China than of England, by imposing upon the credulous seeds and cuttings of yellow moss-roses, and scarlet laburnums, and fragrant pæonies, and such-like!

HOW TO ARRANGE FLOWERS IN A GARDEN.

The Cavendish Society recommend blue flowers to be placed next to orange, and the violet next to the yellow; whilst red and pink flowers are never seen to greater advantage than when surrounded by verdure and by white flowers; the latter may also be advantageously dispersed among groups of blue and orange, and violet and yellow flowers. Plants whose flowers are

* The Dahlia, a native of Mexico, is named from Dahl, the Swede; it was first raised in England in 1804, in the French garden at Holland House, Kensington.

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to produce a contrast should be of the same size; and in many cases the colour of the sand or gravel walks or beds of a garden should be made to conduce to the general effect.

ANCIENT VINEYARDS IN BRITAIN.

From a roll of the household expenses of Richard de Swinfield, Bishop of Hereford, 1289 and 1290, we gather that wine was then of two sorts, red and white; the red imported, the white chiefly, if not altogether, home-made. Early writers celebrate the vineyards of Britain; but they do not lead us to conclude that vineyards were general throughout the island, and those that once flourished in the more genial part of it exist now but in name. Up to this time, however, the culture of the vine was, to some extent, in certain districts attended with success. The leisure and means of churchmen caused them to be the principal promoters of every kind of tillage improvement, whether in enclosed or open ground; and many towns, especially where great religious establishments had been formed, could boast of vineyards in their neighbourhood. Worcester, Gloucester, Tewkesbury, Hereford, and Ledbury, can still point to their vineyard sites. The prolific vines that cover the cottages in the neighbourhood of Worcester, Gloucester, and Hereford have frequently been observed by strangers; and it might fairly be inferred that the climate that brings the apple and pear to perfection would not be unfavourable to the grape. Cantilupe planted or renewed the vineyard which Swinfield had at Ledbury; and it yielded seven pipes (*dolia*) of white wine, and nearly one of verjuice, in the autumn of 1289.

THE STRAWBERRY.

The Strawberry, the Latin name of which is *Fragaria*, supposed to be significant of its fragrance, is indigenous to Britain, and in its wild state is chiefly found in woods and on shrubby banks, but very small in size. It grows in great abundance on the rocky mountains in Norway and on the Alpine ridges in Switzerland. Till within the last thirty years but little attention was paid to its cultivation, and there were not above five or six sorts known. The largest of these was the Hautboy, so called from being originally found in the *haut bois* or high woods of Bohemia; now, by crossing, change of climate, and situation, there are as many hundreds, for they can be multiplied infinitely by skilful inoculation of the varieties.—*Underhill, on the Strawberry*, 2d ed., 1855.

CAUSE OF "RUSSET" ON APPLES.

This is attributed to the alternating temperature, light, ade, dryness, and moisture, which occur many times in the

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course of a day when July or August is showery. Continued rain, preceded and followed by a cloudy sky, does not seem to produce the same effect; but the sudden intense light which commonly succeeds a shower at the time the fruit is wet, injures the skin, and occasions small cracks like the network upon a melon.—*J. Williams, Transactions of the Horticultural Society.*

RHUBARB.

Rhubarb gives us an illustration of the suitability of our climate, the excellence of our soil, and the skill of our cultivators, in utilising exotic plants. The medicinal value of this root was known to the Chinese at a very early period, and European nations received it from China through Turkish traders. The true Chinese rhubarb was first cultivated in this country in 1763. A Gold Medal was awarded to Sir W. Fordyce for raising from seed 300 plants of the *Rheum palmatum*. Since that period its cultivation has so increased in England that many thousands of tons of its succulent stalks are annually sold in our cities for the table, and for the manufacture of wine.

Our horticulturists have again been successful in originating varieties of this root especially adapted to the purposes to which it is now applied. In some sorts the stems are extremely large and juicy, others are valued for their precocity, and others for the opposite quality. In France rhubarb is scarcely known beyond botanic gardens. Some years ago Prince Metternich tasted rhubarb-tart in England, and was so pleased with it that he took care to send some plants to his Austrian garden. On the occasion of a large party the following year, the Prince ordered rhubarb to be served up dressed as it was in England. His cook knew nothing of English usages, and, selecting the large leaves, served them up as spinach. The guests made wry faces at this English dish, and well they might; and rhubarb was discarded from that time from the Prince's table.—*W. Ingram.*

ATTAR OF ROSES.

The rose-water of Kashmir is surprisingly fine; but there is nothing extraordinary in the way it is made. The *Attar* is procured from trebly-distilled rose-water, which is boiled and poured into a basin overnight. Whilst the rose-water is still hot, the basin is placed two-thirds deep in a running stream, and in the morning the *attar* appears like oil on the surface of the water, and is carefully scraped off with a blade of grass bent in the shape of a Y. It is said that a small bottle of *attar* is the produce of 700 or 800 pounds of rose-leaves.—*Vigne's Travels.*

ROSES IN ENGLAND.

Very little faith is to be placed in the assertions of persons ignorant of gardening and botany, as to the date of the introduction of particular plants; as a proof of which may be given the remarkable fact, that Madame de Genlis, when she was in

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England, saw the moss-rose for the first time in her life, and when she returned, took a plant with her to Paris, in order to introduce it into France; though the moss-rose originated in Provence. The musk-rose, Hakluyt tells us, in 1592, was first obtained from Italy, and it also was common in the time of Gerarde. The single yellow-rose was known to Gerarde, but not the double, which was brought to England from Syria before 1629.—*Loudon's Arboretum Britannicum.*

VEGETABLE IVORY.

This Ivory-nut is the produce of a tree found on the banks of the Magdalena, in Columbia, where the natives call it Tagua, or Cabeza de Negro (negro's head), in allusion to the figure of the nut. The fruit at first contains a clear insipid fluid, which becomes milky and sweet, till it acquires solidity and is almost as hard as ivory. Of it the Indians make little toys which are whiter than ivory and as hard if not put under water; and if they are, they become white and hard again when dried. The tree is a palm, and the part of the kernel which resembles ivory is the albumen or nutritious substance which surrounds the embryo, and is destined to feed it when it begins to grow. The Doum Palm of Thebes, the fruit of which is called "gingerbread-nuts" at Alexandria, has a similar albumen, which is turned into beads for rosaries. The albumen of the Double Cocoa-nut is similarly employed.

WHAT IS BLUE MOULD?

A species of fungus which grows on damp and putrefying fruit, bread, cheese, &c., and on plants while drying for the herbarium, if not regularly shifted. The economy of this plant is interesting. At first some white cobweb-like filaments spread over the substance infected, whence sprouts up a thick forest of other filaments about one-eighth of an inch in height, pellucid, tubular, and obscurely marked with one or two joints. Each filament is terminated with a globe, minute to our enlarged vision, but large and heavy when compared with the slender stalk which supports it. This globe is entirely composed of pellucid grains, compacted and arranged in lines of perfect uniformity.—*Johnston's Flora of Berwick.*

FAIRY RINGS.

Fairy rings (says the author just quoted), so common on our grassy links and old pastures, and where

> "Of old the merry elves were seen
> Pacing with printless feet the dewy green,"

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were, when this land was "ful filled of fairie," believed to be the result of their revels; but now, when no man can "see non elve mo," another explanation has become necessary; and the only good one that has been offered is that which attributes them to the peculiar manner of growth which *Agaricus Orcades* and one or two other agarics, affect. They *spring up in circles.* Each circle seems to exhaust the soil of some peculiar nourishment needful for the growth of the fungi, and is rendered incapable of producing a second crop. Hence the circle must unavoidably enlarge; for the defect of nutriment on one side would necessarily cause the new roots to extend themselves solely in the opposite direction, and would occasion the circles of fungi continually to proceed by annual enlargements from the centre outwards. An appearance of luxuriance of the grass would follow as a natural consequence, as the soil of an interior circle would always be enriched by the decaying roots of the fungi of the preceding year's growth. Dr. Withering was the first to offer this explanation of a very curious phenomenon; and it seems satisfactorily established by the subsequent observations of Dr. Wollaston.—*Flora of Berwick.*

BLOOD RAIN.

During the first Great Plague of Rome, in the reign of Romulus, we read in Plutarch that it seemed to *rain blood;* a portent which in ages of barbarism has not been unfrequently recorded. Now the red fungus which presents this appearance has been found to be the concomitant of epidemics in more modern times also, as well as during the continental sweating sickness at Cremona in 1529. Hecker, in his *History of Epidemics,* cites various other instances of the same phenomenon co-existing with some great epidemic; and remarks, that blood-spots, as they were called, went for that reason by the name of *signacula.* They were observed in the plague of the sixth century, and during those of 789 and 959 were called *Lepra vestium.* In the plague of 1500 and 1503 this phenomenon caused great alarm, more especially as the sign of the cross could be recognised in these blood-spots. One of the first persons who considered the thing at all scientifically was George Agricola, who, in the *History of the Plague* that occurred in his day (sixteenth century), pronounced the spots to be caused by a lichen. With its occurrence was connected a great failure of the crops, which is often consequent on the abundance of fungi.—*Dr. Daubeny, F.R.S.*

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Natural Magic.

WONDERS OF THE SUPERNATURAL.

MANY of these Wonders are to be explained by the illusory appearances of the works of nature themselves being transformed into realities by the imagination of the observer. The river in the valley of Mount Ida, which every year ran with blood in commemoration of the death of Memnon, who fell in single combat with Achilles, is an example of this illusion. This fragment of Grecian fable originated in the more ancient tradition, that the river Adonis, which had its source in Mount Lebanon, was coloured annually with the blood of the unfortunate youth who perished by the mortal bite of the wild-boar which he pursued. An inhabitant of Byblos observed that the soil watered by the river was composed of a red earth, which, being dried by the heat, was carried by the wind into the river, and thus communicated to it the colour of blood.

Among the poetical fictions of Greece, was the transformation into a rock, near the island of Corfu, of the Phœnician vessel which brought back Ulysses into Thrace. Pliny mentions that a rock in that locality actually had the appearance of a vessel in full sail, and a modern traveller has described this curious resemblance.—*Bibliothèque Universelle, Littérature*, tom. ii. p. 195.

The foot of Budda is imprinted on Adam's Rock in Ceylon, and the impress of Gaudma's foot is revered among the Birmans. Dr. John Davy conjectures that the one is a work of art; and Colonel Sym regards the other as resembling more a hieroglyphic tablet than a natural phenomenon.

The huge herculean *roccкh* of the same writers is but the exaggerated *condor* of America; and the monstrous *krakes*, which the northern mariners sometimes mistake, to their ruin, for an island, is, probably, but an individual of the cetaceous tribe.

The ancients believed that there were some animals which produced their young from the mouth: now the young of the rattlesnake, when alarmed, often take refuge in the mouth of their mother, and, of course, emerge again when the alarm has ceased.

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HYDROSTATIC WONDERS.

The magic cup of Tantalus, which he could never drink, though the beverage rose to his lips; the fountain in the island of Andros, which discharged wine for seven days, and water during the rest of the year; the fountain of oil which burnt out to welcome the return of Augustus from the Sicilian war; the empty urns which, at the annual feast of Bacchus, filled themselves with wine, to the astonishment of the assembled strangers; the glass tomb of Belus, which, after being emptied by Xerxes, would never again be filled; the weeping statues of the ancients; and the weeping virgin of modern times, whose tears were uncourteously stopped by Peter the Great when he discovered the trick; and the perpetual lamps of the magic temples,—were all the obvious effects of hydrostatical pressure. —*North British Review*, No. 5.

"THE BLOOD OF ST. JANUARIUS."

One of the most imposing miracles of Rome is the Blood of St. Januarius, which is said to have been preserved in a dry state for ages, but liquefied itself spontaneously, and rose and boiled at the top of the vessel which contained it. M. Salverte informs us that this blood of the saint is made by reddening sulphuric ether with alkanet root, and then saturating the liquid with spermaceti. This preparation will remain fixed at a temperature of 10° per cent above freezing, and melts and boils at 20°, a temperature to which it can be raised by holding the phial for some time in the hand.

FIRE-PROOF FEATS OF THE ANCIENTS.

The art of breathing fire, of protecting the human skin from the heat of melted metals or red-hot iron, and of rendering wooden buildings proof against fire, seems to have been practised from the earliest ages. Two hundred years before Christ, Eunus established himself as the leader of the insurgent slaves by breathing fire and smoke from his mouth; and Barchochebas, the ringleader of the revolted Jews in the reign of Hadrian, claimed to be the Messiah from his power of vomiting flames from his mouth. The priestesses of Diana Parasya, in Cappadocia, as Strabo states, commanded public veneration by walking over burning coals; and according to Pliny, the Hirpi family enjoyed the hereditary property of being incombustible, which they exhibited annually in the temple of Apollo on Mount Soracte. Pachymerus tells us that he has seen several accused persons prove their innocence by handling red-hot iron; and, in 1065, the monks produced as a witness, in the great church of Angers, an old man who underwent the proof of

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boiling water, and that too, as their reverences state, *from the bottom of the boiler, where they had heated the water more than usual!* Sylla could not set fire to the wooden tower raised on the Piræus by Archelaus; and Cæsar could not burn the tower of larch, which was doubtless made fireproof by a solution of alum. The use of certain chemical embrocations, the substitution of the fusible metal of Darcet, which melts at a low heat, and the application of plasters of asbestos to the feet, or of a saturated solution of alum to the skin, were among the arts thus called into use.—*North British Review*, No. 5.*

MAGICAL DRINKS.

The professors of ancient as well as modern magic found powerful auxiliaries in the soporific drugs and poisonous beverages which derange the intellectual as well as the physical condition of man. The waters of Lethe, and the beverage of Mnemosyne, which killed Timochares in three months after he had quaffed it in the cave of Trophonius, are examples of the soporific and stupefying drinks of the ancients. The *Nepenthes* of Homer, the *Hyoscyamus Datura*, the *Solanum*, the *Potomantis*, the *Gelatophyllis*, and the *Achamenis* of Pliny, the *Ophiusia* of the Ethiopians, and the *Muchamore* of Kamtschatka, were all the instruments of physical and intellectual degradation. The Old Man of the Mountain, in the time of the Crusades, is said to have enchanted his youthful followers by narcotic and exhilarating draughts. The Hindoo widow is supposed to ascend the funeral pile physically as well as morally fortified against pain. The victims of the Inquisition, similarly prepared, are said to have frequently slept in the midst of their torments; and M. Taboureau assures us that the merciful jailers made their prisoners swallow soap dissolved in water (the vehicle doubtless of more powerful medicaments), to enable them to bear the agonies of torture.—*North British Review*, No. 5.

SOUNDING STONES AND SPEAKING HEADS.

Pausanias tells us that a marvellous stone was placed as a sentinel at the entrance of a treasury, and that robbers were scared away by the trumpet-accent which it sent forth. Mineralogy presents us with several stones which have the property of resonance; and it is probable that a stone of this description was so suspended as to be struck by a metallic projection when the external door of the treasury was opened. Strong boxes or safes have been made to emit sounds to alarm their owners when broken into surreptitiously. M. Salverte states that Louis XV. possessed one of these, and that Napo-

* In an eloquent paper attributed to Sir David Brewster.

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leon was offered one at Vienna in 1809; and we have seen similar boxes, which, when opened by a false key, throw out a battery of cannon and shoot the intruder.

The Clink-stone indicates by its very name its sonorous qualities. The red granite of the Thebaid in Egypt possesses similar properties; and so musical are the granitic rocks on the banks of the Orinoco, that their sounds are ascribed to witchcraft by the natives, while the stones themselves are called by the missionaries *loxas de musica*. Mr. Mawe informs us that there are large blocks of basalt in Brazil which emit very clear sounds when struck; hence the Chinese employ them in the fabrication of musical instruments. Several years since, an artisan of Keswick exhibited a "Rock Harmonicon," composed of slabs of stone, upon which difficult pieces of music are performed.

The Speaking Heads of the ancients contained the terminations of tubes which communicated with living orators, concealed either behind them or at a distance. The speaking head of Orpheus, of such celebrity among the Greeks and Persians, uttered in this manner its oracular responses at Lesbos. Pope Gerbert constructed a speaking head of brass, about A.D. 1000; and Albertus Magnus completed another, which not only moved but spoke. Lucian tells us that the statue of Esculapius was made to speak by the transmission of a voice from behind, through the gullet of a crane, to the mouth of the figure. An examination of the statues at Alexandria indicated the same process; and when the wooden head spoke through a speaking-trumpet at the court of Charles II., a popish priest, to whose tongue it owed its efficacy, was found concealed in the adjoining apartment. Sir A. Smith distinctly heard the sounds issuing from the granite statue of Memnon in Egypt in the morning: these sounds are ascribed by others to the same cause as the sound in granite rocks. M. Salverte regards them as wholly artificial, and the work of Egyptian priestcraft; and he contrives a complicated apparatus of lenses, levers, and hammers, by which he supposes that the rays of the sun, as the prime mover, produce the marvellous sounds:

> "For as old Memnon's image, long renown'd
> By fabling Nilus, to the quivering touch
> Of Titan's ray, with each repulsive string
> Concealing, sounded through the warbling air
> Unbidden strains."
>
> *Akenside's Pleasures of the Imagination*, book i. p. 109.

But the most celebrated of these acoustic wonders is the Jebel Narkous, or "Mountain of the Bell," a low sandy hill in the peninsula of Mount Sinai, in Arabia Petræa, which gives out sounds varying from that of a humming-top to thunder,

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while the sand, either from natural or artificial causes, descends its sloping flanks. From an analogous phenomenon recently observed in our own country by Hugh Miller the geologist, that at Jebel Narkous is thought to be the accumulated sounds occasioned by the mutual impact of the particles of sand against each other.—*Selected and abridged from the North British Review*, No. 5.

MAGNETISM AND MAHOMET'S COFFIN.

With the magnetical knowledge of the ancients, M. Salverte ranks that mariner's compass which, after Mr. W. Cooke, he supposes to be the "intelligence" which animated and conducted the Phœnician navy; and he conceives that the arrow which enabled Abaris to traverse the earth by an aerial route was nothing more than a magnetic needle. The great miracle of modern times, the suspension of Mahomet's coffin in the air, was more than once performed in the heathen temples of the ancients. Now a magnet suspending a weight may have been exhibited as a decoy to the ignorant; but the coffins, if they were suspended at all, were suspended with cords or wires, which, by a judicious arrangement of the lights in reference to the position of the spectator, could be easily rendered invisible.

CHINESE MAGIC MIRRORS.

These Mirrors are called Magical because, if they receive the rays of the sun on their polished surface, the characters or flowers, *in relief*, which exist on the other side, are faithfully represented. The secret of their manufacture is thus explained by Ou-tseu-hing, who lived between 1260 and 1341: "The cause of this phenomenon is the distinct use of fine copper and rough copper. If, on the under side, there be produced by casting in a mould the figure of a dragon in a circle, there is engraved deeply on the disc a dragon exactly similar. Then the parts which have been cut are filled with rather rough copper; and this is, by the action of fire, incorporated with the other metal, which is of a finer nature. The face of the mirror is next prepared, and a slight coating of tin is spread over it. If the polished disc of a mirror so prepared be turned towards the sun, and the image be reflected on a wall, it presents the clear portion and the dark portion, the one of the fine and the other of the rough copper." Ou-tseu-hing adds, that he had ascertained this by a careful inspection of the fragments of a broken mirror.

FABULOUS ANIMALS.

Cuvier considers the greater number of the unknown animals of the ancients to have an origin purely mythological, of

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which the descriptions bear the most unequivocal marks; as in almost all of them we merely see the different parts of known animals, united by an unbridled imagination and in contradiction to every established law of nature. Learned men may attempt to decipher the mystic knowledge connected under the form of the Sphinx of Thebes, the Pegasus of Thessaly, the Minotaur of Crete, or the Chimæra of Epirus; but it would be folly seriously to expect to find such monsters in nature. We might as well endeavour to find the animals of Daniel, or the beasts of the Apocalypse, in some hitherto unexplored recesses of the globe. Neither can we look for the mythological animals of the Persians,—such as the *Martichore*, or destroyer of men, having a head on the body of a lion and the tail of a scorpion; the Griffin, or guardian of hidden treasures, half-eagle and half-lion; or the *Cartazonon*, or wild ass, armed with a long horn on its forehead. Ctesias, who reports these as actual living animals, has been looked upon by some as an inventor of fables; whereas he only attributes real existence to hieroglyphical representations.

The fables of men with tails, the natural apron of the Hottentot women, of the supposed natural deficiency of beard in the Americans, together with syrens, centaurs, &c. can only be excused by the simple easy credulity of our ancestors.

The fables of pigmies may have been credited through the custom of exhibiting in the same sculpture, in bas-relief, men of very different heights; of making kings and conquerors gigantic, while their subjects and vassals are represented as only a fourth or fifth part of their size.

THE SPHINX.

The wide diffusion of this mystical figure seems to indicate that it had some more profound and general signification than the overflow of the Nile. Modern writers mostly reject this interpretation, even in Egypt, and consider it emblematic of the kingly power. Layard, in his first work on Nineveh, suggests that it was more probably an emblem of the Supreme Deity. It is an error to say that the Egyptian Sphinx combined the head of a virgin with the body of a lion. This was the later Greek sphinx, after the primitive idea of its mystical meaning had been lost. "The Egyptian sphinx was invariably male," and united the body of a lion with the head of a man, surmounted by a serpent (Wilkinson's *Ancient Egypt*, 2d series, vol. i. p. 146; and Faber's *Mysteries of the Cabiri*, vol. i. p. 209). This triformed monster occurs in many other countries besides Egypt, viz. in Assyria, with the head of a man, the body of a lion or bull, and the wings of a bird or of a seraph—the flying servent. In Persia and Etruria the same (Chardin's *Travels*,

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and Dennis's *Etruria*, vol. i. p. 51). In Lycia, as the woman, lioness, and seraph (Fellowes's *Lycia*, and sculptures in the Lycian room in the British Museum). It also occurs among ancient Chinese religious emblems (Kaempfer's *Japan*, vol. i. p. 182); likewise in India (Maurice's *Indian Antiquities*, vol. iv. p. 750); and may be seen in the paintings of the ancient Mexicans. Its invariable triple form exhibits the primitive idea of the threefold nature of the Godhead—an idea whose universal diffusion indicates an origin of the most remote (probably antediluvian) antiquity. The globe with wings and serpents, also very widely diffused, seems to represent the same idea, and to be only a variation of the symbolic figure.

SECRET OF THE ALCHEMISTS.

The pretended secret of the Alchemists was their transmutation of the baser metals into gold, which they occasionally exhibited to keep the dupes who supplied them with money in good spirits. This they performed in various ways. Sometimes they made use of crucibles with a false bottom; at the real bottom they put a quantity of gold or silver, which was covered by powdered crucible, mixed with gum or wax; then the material being put into a crucible, and the heat applied, the false bottom disappeared; and at the end of the process the gold or silver was found at the bottom of the crucible. Sometimes they made a hole in a piece of charcoal, filled it with oxide of gold or silver, and stopped up the hole with wax; or they stirred the mixture in the crucible with hollow rods, containing oxide of gold or silver within, and the end closed with wax. By these means the gold or silver wanted was introduced during the operation, and considered as its product. Sometimes they used solutions of silver in nitric acid, or of gold in aqua-regia, or of amalgam of gold or silver; which, being adroitly introduced, furnished the desired quantity of metal. A common exhibition was to dip nails into a liquid, and take them out half-converted into gold; these nails were one-half gold and one half-iron, and the gold was covered with something to conceal its colour which the liquid was capable of removing. Sometimes they used metallic rods, one-half gold and the other silver; the gold was whitened with mercury, and being dipped into the transmuting liquid and heated, the mercury was dissipated, and the gold appeared.

Lord Bacon compares the Alchemists to the young men who carefully digged and re-digged their father's field in search of a treasure which they never found; but whose labour was amply repaid by the fertility imparted to the soil which they turned up with other intentions.

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Domestic Manners.

SPINSTER.

For the first time in the annals of archæology, the early implements of spinning and weaving were met with in the graves of the Alemanni, at Oberflacht, in Suabia, discovered in 1846. Among these were found spindle-pins; but the distaff did not appear. Here were also the perforated rounds of stone, which were probably affixed to the ends of the spindles to cause them to revolve more rapidly by their weight, obedient to the twirl of the industrious housewife.

This manual operation, so indispensable in early times, furnished the jurisprudence of Germany and England with a term to distinguish the female line, *fusus;* and a memento of its former importance still remains in the appellation of *spinster*. Alfred, in his will, speaks of his male and female descendants by the terms of the spear-side and spindle-side; and the German jurisprudents still divide families into male and female by the titles of *schwertmagen*, sword-members, and *spill* or *spindelmagen*, spindle-members. Hence spears in graves are as significant as spindles and spindle-heads.

The term *spinster*, or single woman, in law, is now the common title by which an unmarried female is designated. "*Generosa,*" says Lord Coke, "is a good addition for a gentlewoman; and if such be termed *spinster*, she may abate the writ." This, however, is not so now, for the word *spinster* is applied to all unmarried women of whatever rank or condition. It was formerly customary to call an unmarried lady of station *Mistress* instead of Miss, and this may have the same grounds as Lord Coke's observation.

GOSSIPS.

Gossip is from the Anglo-Saxon *God-sibbe*, "cognatus in Deo."

Our Christian ancestors, understanding a spiritual affinity to grow between the parents and such as undertooke for the child at baptism, called each other by the name of *God-sib*, that is, kin through God; and the child, in like manner, called such his godfathers and godmothers.—*Verstegan.*

LOVERS' PRESENTS.

A Ms. in the Harleian Library states: By the civil law, whatever is given, *exponsalitia largitate*, betwixt them that are

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promised in marriage, hath a condition (for the most part silent) that it may be had again, if marriage ensue not. However, this extends only to gloves, rings, bracelets, and such-like small wares.

THE TRUE LOVE-KNOT.

This emblem is named from the Danish *trulofa, fidem do* (Lat.), 'I plight my troth or faith;' a knot among the northern nations being the symbol of love, faith, and friendship, pointing out the indissoluble tie of affection and duty. Sir Thomas Browne, with his usual erudition, says: "The true lover's knot had perhaps its origin from *nodus Herculanus*, or that which was called after Hercules; his knot resembling the snaky complication in the caduceus, or rod of Hermes, and in which form the zone or woollen girdle of the bride was fastened, as Turnebus observes in his *Adversaria*. Hence evidently the bride-favours or top-knots at marriages, which were formerly of various colours."

MARRIAGE IN THE CHURCH-PORCH.

By an old law, before the face of, and at the door of, the church, could the marriage-dower be legally assigned. Chaucer alludes to this custom in his *Wife of Bath:*

"She was a worthy woman all her live,
Husbands at the church-dore had she five."

The marriage of Francis II. with Mary Stuart took place at the door of Nôtre Dame.

THE BRIDE'S VEIL

originated in the Anglo-Saxon custom of performing the nuptial ceremony under a square piece of cloth, held at each corner by a tall man over the bridegroom and the bride to conceal her virgin blushes; but if the bride was a widow, the veil was dispensed with.

THE BRIDE-CAKE

originated in *confarreation*, or a token of the most firm conjunction between man and wife, with a cake of wheat or barley, from *far* (Latin), bread or corn. Dr. Moffat tells us that "the English, when the bride comes from church, are wont to cast wheat upon her head." Herrick says, speaking to the bride:

"While some repeat
Your praise, and bless you, sprinkling you with wheat."

In Yorkshire the bride-cake is cut into little square pieces, thrown over the bride and bridegroom's head, then put through the ring nine times, and afterwards laid under pillows at night, to cause young persons to dream of their lovers.

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ROSEMARY AT WEDDINGS.

Rosemary was anciently thought to strengthen the memory. For weddings it was gilded and dipped in scented water. In a curious wedding-sermon (for such were formerly common), by Dr. Hacket, dated 1607, the use of this plant at weddings is thus set forth:

"Rosmarinus, the rosemary, is for married men; the which, by name, nature, and continued use, man challengeth as property belonging to himself. It overtoppeth all the flowers in the garden, boasting man's rule. It helpeth the braine, strengtheneth the memorie, and is very medicinable for the head. Another property of the rosemary is, it affects the hart. Let this Ros Marinus, this Flower of Men, ensigne of your wisdom, love, and loyaltie, be carried not only in your hands, but in your heads and harts."

Dekker thus touchingly alludes to the twofold uses of rosemary, when speaking of a bride who died of the plague on her wedding-day: "Here is a strange alteration: for the rosemary that was washt in sweet water to set out the bridall, is now wet in teares to furnish her buriall." Brand tells us that, so late as 1698, the old country use was kept up of decking the bridal-bed with sprigs of rosemary. Rosemary was also common at funerals:

"To show their love, the neighbours far and near
Followed, with wistful look, the damsel's bier;
Sprigg'd rosemary the lads and lasses bore,
While dismally the parson walk'd before."—*Dirge by Gay.*

Misson, in his *Travels in England*, says: When the funeral procession is ready to set out, "a servant presents the company with sprigs of rosemary; every one takes a sprig, and carries it in his hand till the body is put into the grave, at which time they all throw in their sprigs after it."

ORANGE-BLOSSOMS WORN AT WEDDINGS.

The use of these flowers at bridals is said to have been derived from the Saracens, or at least from the East, and they are believed to have been thus employed as emblems of fecundity.

THE WEDDING-RING.

The supposed heathen origin of our Marriage Ring had well-nigh caused the abolition of it during the Commonwealth by the Puritans:

"Others were for abolishing
That tool of matrimony, a ring,
With which th' unsanctify'd bridegroom
Is married only to a thumb
(As wise as ringing of a pig,
That us'd to break up ground and dig);
The bride, to nothing but her will,
That nulls the after-marriage still."—*Hudibras.*

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MARRIAGE OF COUSINS.

There is a popular notion extant, that first Cousins may marry, and second Cousins not; and that second Cousins can marry and first Cousins not: both opinions are equally fallacious. It is legal for a man or woman to marry either his or her first or second cousin.

MORGANATIC MARRIAGE.

This signifies, among German princes, a union in which it is stipulated that the wife, being of inferior birth to her husband, neither she nor her children shall enjoy the privileges of his rank nor inherit his possessions. The marriage is, however, a good one, being strictly legal; and the children are legitimate. *Morganatic* is by some interpreted as akin to the Gothic *mourgjan*, to shorten or limit; an application of the word which would naturally rise out of the restrictions imposed on the wife and children of such a marriage. By others the term is referred to *morgengabe*, a free gift made by the husband after the first marriage-night. Or it is thought to mean left-handed, from the left hand being given in the ceremony instead of the right.

THROWING THE OLD SHOE.

The old custom of Throwing an Old Shoe after a person is still, in many rural districts, believed to propitiate success, as in servants seeking or entering upon situations or about to be married. But it may be questioned whether the old shoe has been thrown for luck only; and we are rather inclined to agree with Mr. Thrupp, in *Notes and Queries*, No. 182, that in Scripture "the receiving of a shoe was an evidence and symbol of asserting or accepting dominion or ownership; the giving back a shoe the symbol of rejecting or resigning it." The latter is evidenced in Deut. xxv., where the ceremony of a widow rejecting her husband's brother in marriage is by loosing his shoe from off his foot; and in Ruth we see that "it was the custom in Israel concerning changing that a man plucked off his shoe and delivered it to his neighbour." Hence Mr. Thrupp suggests that "the throwing a shoe after a bride was a symbol of renunciation of dominion and authority over her by her father or guardian: and the receipt of the shoe by the bridegroom, even if accidental, was an omen that the authority was transferred to him."

In Yorkshire the custom of throwing an old shoe over a wedding-party is called *trashing*.

MARRIAGES EN CHEMISE.

There is a vulgar error, that if a woman who has contracted

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debts previous to her marriage leave her residence in a state of nudity, and go to that of her future husband, he, the husband, will not be liable for any such debts. Now this opinion is probably founded, not exactly in total ignorance, but in a misconception of the law. The text-writers inform us, that "the husband is liable for the wife's debts *because* he acquires an absolute interest in the personal estate of the wife," &c. (Bacon's *Abridgment*, tit. "Baron" and "Féme.") Now an unlearned person who hears this doctrine might reasonably conclude, that if his bride has no estate at all, he will incur no liability; and the future husband, more prudent than refined, might think it as well to notify to his neighbours by an unequivocal symbol that he took no pecuniary benefit with his wife, and therefore expected to be free from her pecuniary burdens. In this, as in almost all other popular errors, there is found a substratum of reason.—*E. Smirke; Notes and Queries*, No. 166.

In Burn's *History of Fleet Marriages*, p. 77, occurs this entry:—"The woman ran across Ludgate Hill in her shift;" to which the editor has added this note:—"The *Daily Journal* of 8th November 1725 mentions a similar exhibition at Ulcomb, in Kent. It was a vulgar error that a man was not liable to the bride's debts if he took her in no other apparel than her shift."

GRETNA-GREEN MARRIAGES.

In Scotland, nothing further has been necessary to constitute a man and woman husband and wife than a declaration of consent by the parties before witnesses, or even such a declaration in writing without any witnesses; a marriage which has been considered binding in all respects. Still, a marriage in Scotland not celebrated by a clergyman (with the exception of the notorious Gretna-Green marriages*), is rarely or never heard of;—the truth is, what the Scottish people have eschewed as evil, the more lax English have availed themselves of to ward off the rigour of their own law; and matches so made appear to have been almost exclusively "stolen" or "runaway," and the parties all English. The trade was established by a tobacconist, not a blacksmith, as is generally believed; and the name of "Gretna Green" arose from his residence on a common or *green* between Graitnay and Springfield, to which latter village he removed in 1791. Gretna Green was the place chosen, as the nearest locality accessible to strangers actually within the territory of Scotland. In 1815, the number of marriages celebrated

* And those performed at Lamberton Toll-Bar, about three miles north of Berwick-upon-Tweed. The Gretna-Green marriages have at length been prevented. By an act 19 and 20 Vict. c. 88, it was provided that, after the 31st December 1856, no such marriage contracted in Scotland, by declaration, acknowledgment, or ceremony, should be valid, unless one of the parties had at the date thereof his or her usual place of residence there, or had lived in Scotland for twenty-one days next preceding such marriage.

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at Gretna was stated, in Brewster's *Edinburgh Encyclopædia*, at sixty-five, which produced about 1000*l.*, at the rate of fifteen guineas each.

ROYAL MARRIAGES.

There is a common but erroneous idea abroad that the Royal Marriage Act prevents the marriage of the members of the royal family with English women. The statute enacts that no descendant of George the Second (other than the issue of princesses married into foreign families) shall marry any subject without the consent of the reigning sovereign, signified under the great seal; and if the marriage be contracted without such consent, it is void. Provided, however, that such descendants as are above the age of twenty-five may, after a twelvemonth's notice given to the Privy Council, marry without the consent of the Crown, unless both Houses of Parliament before the end of such twelvemonth declare their disapprobation. By the common law of England, independently of the marriage-act, the reigning sovereign has always the right to control the marriages of his children and heirs, and of the heir-presumptive to the throne. The Royal Marriage Act only provides that no descendant of George the Second shall have a right to marry without that consent, except under certain circumstances.—*Sir John Campbell, Attorney-General.*

PROLONGED ABSENCE NO LEAVE FOR A SECOND MARRIAGE.

It is a vulgar and very dangerous error to suppose that any term of absence of one of two persons married will, while that party is living, permit of the other marrying again. This misconception, but too fatally prevalent among the lower classes, has arisen from a clause in the statute relating to Bigamy, the 9 Geo. IV. c. 31, s. 22, which provides that no punishment therein enacted shall extend to any person marrying a second time, whose husband or wife shall have been continually absent from such person for the space of seven years then last past, and shall not have been known by such person to be living within that time. Thus the party marrying under these circumstances is by this clause certainly protected from a conviction for bigamy, and its consequent pains and penalties, but that is all. The second marriage will nevertheless be absolutely void should the party absent turn out at any time, however long, to have been alive when it was contracted. Nothing but death or a divorce *à vinculo matrimonii* can sever a marriage once legally performed.

SELLING A WIFE.

The popular, and with foreigners prevalent, idea, that a man may legally dispose of his wife by exposing her for sale

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in a public market, may not improbably have arisen from the correlation of the terms buying and selling. The custom of purchasing wives was universal among ancient nations, and obtained to some extent among the higher orders of society. Of this an instance may be found in Grimaldi's *Origines Genealogicæ* (London, 1828, 4to), in which John de Camoys, son and heir of Sir Ralph de Camoys, yields up to Sir William de Paynel, knight, his wife Margaret, daughter and heiress of Sir John de Gatesden, and makes over to Sir William all her goods and chattels, and consents and grants that she shall abide and remain with him during his pleasure. This grant was pronounced by parliament in 1302 to be invalid. There has been, however, in our times, a vile custom among the profligate of the lower classes, which some of them have magnified into a law: it is that of a brute of a husband, wanting to get rid of his wife, taking her into the market on some fair or market-day with a rope round her neck, setting her up to be bid for, and completing the bargain for half-a-crown or five shillings. Thus, in March 1834, a man led his wife by a halter to Smithfield Market, in Birmingham; and a similar practice was once common in Smithfield, London. This does not, as thought, constitute a divorce; the object of the shameless ceremony is a public acknowledgment that the husband surrenders all idea or right of taking an action against the man who lives with his separated wife. But the custom is directly punishable by law as a misdemeanour; and at the West Riding Yorkshire Sessions, June 28, 1837, Joshua Jackson, convicted of *selling his wife*, was sentenced to be imprisoned for one month with hard labour.

FUNERAL FEASTS.

The old custom of inviting the friends and neighbours of a wealthy person to dinner on the day of his interment, originated in a solemn festival which was anciently made at the time of publicly exposing the corpse. Its object was to exculpate the heir, and those entitled to the possessions of the deceased, from fines and mulcts to the lord of the manor, and from all accusation of having used violence; so that the persons convoked might avouch that the person died fairly, and without suffering any personal injury. The dead were thus exhibited by ancient nations; and perhaps the custom was introduced here by the Romans.—*Hutchinson's History of Cumberland.*

BURIAL IN CHURCHES AND CHURCHYARDS.

Burying in Churches became general from persons of reputed sanctity being first placed there. Founders and patrons, and other great names, began to creep as near as they could to

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the fabric, and so were laid in the porch, or in the entry of the cloisters, or in the cloister itself, before the chapter-house door, or in the chapter-house, or in the sacristy. Sometimes the bodies were deposited in the wall; first on the outside, and then inside the wall. In process of time they began to erect side-aisles, and to bury and establish chantries in them; after which they made free with the body of the church; and lastly, but chiefly since the Reformation, except in the cases of sanctity above mentioned, they had recourse to the chancel.

Churchyards were first used for interment because of the superstitious dread of the living. Before the time of Christianity, it was unlawful to bury the dead within cities; but they were carried out into the fields, and there deposited. Towards the end of the sixth century, Augustine obtained of King Ethelbert a temple of idols (where the king used to worship before his conversion), and made a burying-place of it; but St. Cuthbert afterwards obtained leave to have yards annexed to the churches proper for the reception of the dead.

Cemetery-burial is a return to the custom of 1200 years since, though for very different reasons: our forefathers buried there through fear, but we have made the change on account of the crowded state of our churches and churchyards, and a very proper consideration of the public health.

BURIAL AT CROSS-ROADS.

The temples, or rather altars, of the heathen Teutons were mostly at the junction of cross-roads. Hence the place of execution was there, criminals being sacrificed to the gods; hence too suicides were buried at the cross-roads, to give as strong an impression as possible of a heathen burial.—*Archæologia*, vol. xxxvi. p. 155.

WHAT IS URN-BURIAL?

The placing of the ashes of the dead in a votive *urn*, instead of the burial of the body in the earth. Sir Thomas Browne has left us a very learned discourse upon this custom, or *Hydriotaphia*, in favour of *cremation*, or burning; "for," says he, "to be knaved out of our graves, to have our skulls made drinking-bowls, and our bones turned into pipes, to delight and sport our enemies, are tragical abominations escaped in burning burials."

THE BARBER'S POLE.

The Barber-Surgeon was formerly known by his Pole at the door, the reason of which is sought by a querist in the *British Apollo*, fol., London, 1708, No. 3:

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"I'de know why he that selleth ale
Hangs out a chequer'd part per pale;
And why a barber at port-hole
Puts forth a party-coloured pole.

Answer.

In ancient Rome, when men lov'd fighting,
And wounds and scars took much delight in,
Man-menders then had noble pay,
Which we call *surgeons* to this day,—
'Twas order'd that a huge long pole,
With basin deck'd, should grace the hole,
To guide the wounded, who unlopt
Could walk, on stumps the other hopt.
But when they ended all their wars,
And men grew out of love with scars,
Their trade decaying, to keep swimming,
They join'd their other trade of trimming;
And to their poles, to publish either,
Thus twisted both their trades together."

The pole was used by the barber-surgeon for the patient to grasp in blood-letting, a fillet or bandaging being used for tying his arm. When the pole was not in use, the tape was tied to it, and twisted round it; and thus both were hung up as a sign. At length, instead of hanging out the actual pole used in the operation, a pole was painted with stripes round it, in imitation of the real pole and its bandages: hence the barber's pole.

Lord Thurlow, in his speech for postponing the further reading of the Surgeons' Incorporation Bill, July 17, 1797, stated, that "by a statute still in force the barbers and surgeons were each to use a pole."

Barbers have in our time let blood, and drawn teeth: the last we remember of this class (and with pain) was one Middleditch, of Great Suffolk-street, Southwark, in whose window were displayed heaps of drawn teeth.

SHAVING THE BEARD.

Dr. Elliotson, in his *Human Physiology*, 5th edit., says:

It cannot but be a custom most insulting to nature to shave off the beard, which, if kept in proper trim, as birds and beasts instinctively keep their plumage and hair in good order, completes the perfection of man's face, and the external distinction of the sexes; and, whatever ladies pretend to the contrary, renders him far more attractive to women—at any rate when custom has had time to lessen their seeming repugnance; for their preference to men with good whiskers is certain. Shaving was forbidden by Moses, and therefore, according to Jews and Christians, by God; it was a severe punishment among the Indians, and an irreparable insult among the Germans. The Osmanli swears by his beard, and spends half his day upon it. Shaving prevails in Europe because the kings of France set the example to their courtiers, who were followed by the nation, which formerly gave the *ton*

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to neighbouring nations, and therefore was at length followed by all in this troublesome and unmanly fashion.

WEARING FALSE HAIR.

About the year 1595, when the fashion became general in England of wearing a greater quantity of Hair than was ever the produce of a single head, Stubbes informs us that it was dangerous for any child to wander, as nothing was more common than for women to entice such as had fine locks into private places, and there cut them off. To this fashion the writers of Shakspeare's age do not appear to have been reconciled. So, in *A Mad World, my Masters*, 1608, "To wear periwigs made of *another's hair*, is not this against kind?" Again, in Dryden's *Mooncalf:*

> "And with large sums they stick not to procure
> Hair from the dead, yea, and the most unclean:
> To help their pride they nothing will disdain."

Again, in Shakspeare's 68th sonnet:

> "Before the golden tresses of the dead
> The right of sepulchres were shorn away,
> To live a second life on second head
> Ere *beauty's dead fleece* made another gay."

And in *Timon of Athens:*

> "And thatch your poor thin roofs
> With burdens of the dead;—some that were hanged,
> No matter," &c.

ARTIFICIAL TEETH.

The date of the introduction of Artificial Teeth into England or Europe is uncertain. Two passages in Ben Jonson's play of the *Silent Woman*, 1609, act i. sc. 1, and act iv. sc. 1, refer to them in terms which imply their common use. In this latter passage, Otter says of his wife: "A most vile face! and yet she spends me 40*l.* a year in mercury and hog's bones. All her teeth were made in the Black-Friars," &c.

"THE GREAT BED OF WARE."

Few objects of antiquarian curiosity acquired more notoriety than a Bedstead or Bed of unusually large dimensions, preserved at Ware, twenty miles from London, on the road to Cambridge. Shakspeare employs it as an object of comparison in his play of *Twelfth Night*, bearing date 1614, where Sir Toby Belch says: "As many lies as will lie in this sheet of paper, though the sheet were big enough for the bed of Ware in England." (Act iii. sc. 2.) Nares, in his *Glossary*, says: "This curious piece of furniture is said to be still in being, and visible at the Crown or at the Bull in Ware. It is reported to be twelve feet square, and to be capable of holding twenty or twenty-four

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persons." And he refers to Chauncey's *Hertfordshire* for an account of the bed receiving at once twelve men and their wives, who lay at the top and bottom in this mode of arrangement,—first two men, then two women, and so on alternately,—so that no man was near to any woman but his wife. Clutterbuck, in his History, places the great bed at the Saracen's Head inn, where a large bedstead is preserved. It is twelve feet square, of carved oak, and has the date 1463 painted on the back; but the style of the carving is Elizabethan. It was *traditionally* sold among other movables which belonged to Warwick, the king-maker, at Ware Park, to suit which story the date is thought to have been painted. This bedstead is nicely engraved on wood, by Landells, in the *Literary World*, vol. ii.

BELLS ON HORSES.

Bells were a favourite addition to the caparisonment of a horse in the early times of chivalry. A troubadour poet, Arnold of Marsan, gives very grave reasons for wearing them. He says: "Let the neck of the knight's horse be garnished with bells, well hung. Nothing is more proper to inspire confidence in a knight and terror to an enemy. The war-horse of a soldier of a religious order of knighthood might have his *collar of bells*, for their jingling was loved by a monk himself:

> And when he rode, men his bridle hear
> Gingleing in a whistling wind as clere
> And eke as loud as doth the chapel-bell."

"SHAMMING ABRAM."

When Bethlehem Hospital was first built in Moorfields, there was a ward of it named "Abram's;" and hence the poor idiots confined therein were called "Abram's men." They wore the dress of the hospital; and on the 1st of April such as were incapacitated had a holiday and visited their friends, or begged about the streets. This induced vagrants to imitate the Bethlehem dress and pretend idiotcy; till the governors of the hospital ordered that if any person should "sham an Abram," he should be whipped and set in the stocks; whence came the saying, he is "shamming Abram." In Dekker's *English Villanies* these impostors are described: "an Abram" was a name for a ragged fellow; and an "Abram man" often personated a poor lunatic called "Tom of Bedlam," which Shakspeare describes in *King Lear*, act ii. sc. 3, as "Bedlam beggars." Among sailors "an Abram" is being unwell, and to "sham Abram" is to feign illness. When Abraham Newland was cashier of the Bank of England arose the song,

> "I have heard people say, sham Abraham you may,
> But you must not sham Abraham Newland;"

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meaning thereby that you must not imitate or forge a bank-note, a crime then punished with death.

LEASING OR GLEANING.

This ancient custom has existed three thousand years and upwards, as testified by Ruth, who gathered three pecks and over in a day.

"If it were not then first instituted, it was secured and regulated by an especial ordinance of the Almighty to the Israelites in the wilderness, as a privilege to be fully enjoyed by the poor of the land whenever their triumphant enemies should enter into possession of Canaan. By this law the leasing of three products was granted to the destitute inhabitants of the soil,—the olive, the grape-vine, and corn: the olive was to be beaten but once; the scattered grape in the vintage was not to be gathered; and in the field where the corn grew clean riddance was not to be made, the corners were to be left unreaped, and even the forgotten sheaf was not to be fetched away by the owner, but to be left for the poor and the stranger, the fatherless and the widow. This was not simply declared once, as an act of mercy, but enjoined and confirmed by ordinances thrice repeated, and impressed with particular solemnity: 'I am the Lord thy God: I have given thee all; and I command unreserved obedience to this my appointment.'"—*L. Knapp; Journal of a Naturalist.*

No person has by the common law of England a right to glean in a harvest-field. The practice is merely a permission.

PAWNBROKERS' THREE BALLS.

This sign was taken from that of the Italian bankers, generally called Lombards, who were the first to open loan-shops in England for the relief of temporary distress. The greatest of the Lombards were the celebrated and eventually princely house of the Medici of Florence. They bore pills on their shield (and those pills, as usual then, were gilded), in allusion to the professional origin from whence they had derived the name of Medici; whence their agents in England and other countries placed their armorial bearings over their doors, and others adopted the sign.

OFFICERS OF STATE AND COURT.

The Rev. H. Christmas,—who, in a paper read to the Royal Society of Literature, read from Wardrobe Accounts and Expenses of Royal Households several extracts,—is of opinion that a careful comparison of accounts of this nature with the expense of her present Majesty's establishment will prove that the latter is certainly not greater than that of the court in the time of Queen Elizabeth, and is much less than that of the court of James I. Looking further back, it may be imagined what must have been the expenses of the court of the time of

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Richard II., when there were 300 servitors attached to the kitchen alone, when every other office was furnished in the same proportion, and when ten thousand persons had meat and drink allowed them. The difficulty of estimating the real expenditure of past times is, of course, much increased by the fact of the difference between the value of money in present and past times. But, taking this difference at its lowest estimate, we may see how enormous was the expenditure of the court of James I., which was 129,863*l.* 9*s.* 0½*d.*; although the king had corn and cattle served by the several counties at under prices, that the farmers might get rid of purveyors. Prince Henry's establishment kept pace with that of his father. After citing various examples of this nature, Mr. Christmas gave the titles, and explained the duties of the great officers of the crown. Those of the Lord Great Chamberlain, as bearing reference in many points to a peculiar state of society. These are thus specified: "The Lord Great Chamberlain of England is an officer of great antiquity, to whom belong living and lodging in the king's court, and certain fees due from each archbishop and bishop, when they do their homage or fealty to the king; and from all peers of the realm at their creation or doing their homage or fealty; and at the coronation of any king to have forty ells of crimson velvet, for his own robes, and on the coronation-day, before the king riseth, to bring his shirt, coife, wearing-clothes; and after the king by him is apparelled and gone forth, to have his bed and all furniture of his bed-room for his fees, all the night-apparel; and to carry at the coronation the coife, gloves, and linen to be used by the king on that occasion; also the sword and scabbard, and the gold to be offered by the king, and the robe-royal and crown; and to undress and attire the king with his robes royal, and to serve the king that day before and after dinner with water to wash his hands, and to have the basin and towel for his fees."

CARP, PIKE, TURKEYS, AND HOPS.

Leonard Mascall takes credit to himself for having introduced the Carp as well as the Pippin; but notices of the existence of the carp in England occur prior to Mascall's time (1660). Dame Juliana Barnes, in her *Boke of St. Alban's* (1496) mentions carp as "a deyntous fisshe;" and in the Privy-Purse expenses of Henry VIII., in 1532, various entries are made of rewards to persons for bringing "carps to the king." The old couplet is certainly erroneous:

> "Turkeys, carp, hops, pickerel, and beer,
> Came into England all in one year."

Pike, or pickerel, were the subject of legal regulations in the

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reign of Edward I. Carp are mentioned as above. Turkeys were unknown till 1524; but "hoppes" are entered in the Customs Roll of Great Yarmouth, 32d Henry VI. (1453-4). Beer, without hops, was an old national beverage from the days of the Celts downward; and an excise on beer existed as early as 1284, and also in the reign of Edward I.

SALLY-LUNN CAKES.

Hone, in his *Every-day Book*, vol. ii. p. 1561, records:

"The bun, so fashionable, called the *Sally Lunn*, originated with a young woman of that name at Bath, about thirty years ago. (This was written in 1826.) She cried them in a basket, with a white cloth over it, morning and evening. Dalmer, a respectable baker and musician, noticed her, bought her business, and made a song and set it to music in behalf of Sally Lunn. This composition became the street favourite, barrows were made to distribute the nice cakes, Dalmer profited thereby, and retired; and to this day the Sally-Lunn cake claims pre-eminence in all the cities of England."

HARD-DRINKING.

That Hard-drinking was introduced from Flanders and Holland, and other northern countries, seems probable from the derivation of many of the expressions used in carousing. The phrase of being "half-seas-over," as applied to a state of drunkenness, originated from *op zee*, which, in Dutch, means *over sea;* and Gifford informs us that it was a name given to a stupefying beer introduced into England from the Low Countries, and called *op zee*. An inebriating draught was also called an *up see freese*, from the strong Friesland beer. The word "carouse," according to Gifford and Blount, is derived from the name of a large glass, called by the Danes *rouse*, or from the German words, *gar*, all, and *aus*,—hence drink *all out*.

"HOB-NOB."

This phrase, now only used convivially, to ask a person whether he will have a glass of drink or not, is most evidently a corruption of the old *hab-nab*, from the Saxon *habban*, to have, and *nabban*, not to have; in proof of which Shakspeare has used it to mark an alternative of another kind:

"And his incensement at this moment is so implacable, that satisfaction can be none but by pangs of death and sepulchre; *hob-nob* is his word; give't or take't."—*Twelfth Night*, act iii. sc. 4.

THE LOVING CUP.

In the *Curiosities of London*, voc. Halls, we find this illustration of a civic custom, which is honoured to this day:

The Loving Cup is a splendid feature of the Hall-feasts of the City and Inns of Court. The cup is of silver or silver-gilt, and is filled with spiced wine, immemorially termed "sack." Immediately after

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the dinner and grace, the Master and Wardens drink to their visitors a hearty welcome; the cup is then passed round the table, and each guest, after he has drunk, applies his napkin to the mouth of the cup before he passes it to his neighbour. The more formal practice is for the person who pledges with the loving cup to stand up and bow to his neighbour, who, also standing, removes the cover with his right hand, and holds it while the other drinks; a custom said to have originated in the precaution to keep the right, or dagger-hand, employed, that the person who drinks may be assured of no treachery, like that practised by Elfrida on the unsuspecting King Edward the Martyr at Corfe Castle, who was slain while drinking. This was why the loving cup possessed a cover.—*F. W. Fairholt, F.S.A.*

KNIVES AND FORKS.

Stow relates that Richard "Matthews, on Flete Bridge, was the first Englishman who attayned the perfection of making fine knives and knife-hafts; and in the fifth year of Queen Elizabeth he obtained a prohibition against all strangers, and others, for bringing any knives into England from beyond the seas, which until that time were brought into this land by shippen lading from Flanders, and other places." Thus, "the knyves of Almagne, knyves of France, knyves of Collogne," are enumerated in the Custom-house rate-books of the time of Henry VIII. "Albeit (continues Stow), at that time, and for many hundred years before, there were made, in divers parts of the kingdom, many coarse and uncomely knives; and at this day the best and finest knives in the world are made in London." Although the historian, in this passage, directly refers to the early existence and extent of the cutlery-trade, inconsiderate copyists have drawn from it a loose statement, to the effect that "knives were first made in England in 1563, by Thomas Matthews, on the Fleete Bridge, London." Against this assertion, besides the testimony of Stow, and the common tradition of the Hallamshire cutlers, has to be set the undoubted fact, that, so early as the year 1417, the cutlers of the metropolis sought and obtained a charter of incorporation from Henry V. That knives were made at Sheffield at least a century earlier than the preceding date, appears indisputable, from the incidental testimony of the poet Chaucer, who, in his Reeve's Tale, states of the miller of Trompyngtoun, that, among other accoutrements,

"A Scheffeld thwitel bar he in his hose."

A thwitel, or whittle, was a knife carried by a person who was not entitled to wear a sword. We find "a case of Hallamshire whittles," mentioned by the Earl of Shrewsbury, in a letter to Lord Burleigh, in the year 1575; and "whittell" is, among the Sheffield manufacturers, to this day the name of a common kind of knife.

Beckmann, generally an accredited authority upon domestic

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antiquities, states forks to have been brought into use by the Italians, about the end of the fifteenth century: this conjecture being founded on a passage in the *Life of Corvinus*, king of Hungary, written by an Italian who was resident at his court some time between the years 1458 and 1490; in which it is mentioned that forks were not used at table, *as then in Italy*, but that each person took his meat out of the same dish with his fingers. Beckmann likewise states forks not to have been introduced into England until the seventeenth century, his authority being taken from a singular book of Travels, published in 1611, entitled *Crudities*, by one Coryate, an Englishman, who having seen forks used in Italy says: "Hereupon I myself thought good to imitate the Italian fashion by the forked cutting of meat, not only while I was in Italy, but also in Germany, and oftentimes in England since I came home; being once quipped for that frequent using of my forke by a certain learned gentleman, a familiar friend of mine, one Mr. Lawrence Whittaker, who, in his merry humour, doubted not to call me at table *furcifer*, for only using a fork at feeding, but for no other sense."

Upon these two statements, until within these few years, the use of forks in Italy and England was believed to be a modern refinement; and this may probably have given rise to the truism, "fingers were made before forks." In both respects, however, is Beckmann incorrect. First, Peter Damiani describes the luxury of the wife of the Doge of Venice, who would not eat with her fingers, but absolutely had her food cut into pieces by her attendants, and then she actually conveyed them to her mouth with certain golden two-pronged forks; thus showing that forks were a novelty in Italy in Damiani's days, *i.e.* about the time of William the Conqueror.

That forks were used in England upwards of three centuries before the date stated by Beckmann, is proved by their being mentioned in an inventory of furniture belonging to Edward I. That the fork, moreover, was known to the Anglo-Saxons is proved by an example found with coins of Ceolnoth, Berhtulf, Egbert, Ethelwulf, and Athelstan, ranging from the year 796 to 890, at Sevington, Wilts (*Archæologia*, vol. xxvii. p. 301). This fork is, however, supposed to have been used for sacred purposes; but a knife and fork, apparently implements of daily use, were found in 1853, in excavating an Anglo-Saxon burial-ground at Harnham Hills, near Salisbury (*Archæologia*, vol. xxxv. p. 266). The fork was not unknown to the Romans, as may be seen by the specimen engraved by Caylus, and stated by him to have been found in the Appian Way; but this, like the later specimen found at Sevington, may have been used for sacred purposes.

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TODDY,

the term for a mixture of spirits and water, appears to be taken from the Indian word *tari* or *tadi*, pronounced *toddy* by Europeans,—the sap or wine of a palm.—*Craufurd.*

THE TEA-CADDY.

This is a corruption of the Malay name of a Chinese weight, being the hundredth part of a *pikul* or man's load, and reckoned at a pound and a third avoirdupois. The name of this weight is *kati*, usually written by Europeans *cattie* or *catty*.

COFFEE

is derived from the Arabic *kahwah*,—Turkish *kahve*, says Mr. Craufurd, in the *Proceedings of the British Association.* The English word evidently comes direct from the Turkish. The coffee-plant is a native of Abyssinia, and not of Arabia; for it was not known at Mecca until 1454, only forty years before the discovery of America. The true name of the plant is *ban*,—and *kahwa*, or coffee, means "wine," as a substitute for which the decoction was used; although the legality of the practice was long a subject of dispute by the Mohammedan doctors. From Arabia it spread to Egypt and Turkey, and from the last-named country was brought to England in 1650. In sixty years' time it was familiarly known, at least in fashionable society, as we find from Pope's well-known lines in the *Rape of the Lock*—

> "Coffee, which makes the politician wise,
> And see through all things with his half-shut eyes."

HOTCHPOT.

Two illustrious luminaries of the law have derived the origin of hotchpot (*vulgo*, hodgepodge), as follows:

"It seemeth me that this word (Hotchpot) is in English a pudding; for in this pudding is not commonly put one thing alone, but one thing with other things together."—*Littleton*, sect. 267.

"Hutspot or Hotspot is an old Saxon word, and signifieth so much as Littleton here speaks."—*Coke upon Littleton*, 477 a.

MINIKIN PINS.

The Latins called dwarfs *Homunciones*, the Italians *Piccoluomini*, the Flemings *Mennekin:* whence, no doubt, our term *Mannikin* given to little men, and *Minikin* to small pins.

WHAT IS A MARTINET?

This term is derived from the general officer, M. de Martinet, who was, as Voltaire states, celebrated for having restored and improved the discipline and tactics of the French army;

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whence very strict officers came to be called *martinets.*—*Notes and Queries*, No. 44.

ORIGIN OF FARM.

Spelman derives this word from the Saxon *feærme* or *feorme*, which signifies *victus*, food or provision; as the tenants and country-people anciently paid their rents in victuals and other necessaries of life. Hence a *farm* was originally a place which supplied its owner or lord with provisions. The word *ferme* is also French, and a farm is probably so called from its being a firm or fixed possession of the land by one who labours on it.

WHEN WERE UMBRELLAS FIRST INTRODUCED INTO ENGLAND?

Umbrellas are of great antiquity: among the Greeks they were a mark of elevated rank, and one is seen on a Hamilton vase in the hands of a princess. We find the umbrella figured upon the ruins of Persepolis; and the Romans carried it at the theatre to keep off the sun. Yet Coryate, the traveller, in 1611, notices the umbrellas of Italy as rarities. These and other umbrellas are only described for keeping off the sun, which may be explained by the comparative scarcity of rain in the above countries. The frequency of rain in our island led to their being used for a very different purpose. Drayton, 1630, has

> "Like *umbrellas* with their feathers,
> *Shield you in all sorts of weathers*;"

and a previous line indicates that they were used to keep off "sunne" as well as rain. Swift (*Tatler*, October 17, 1710) describes umbrellas in common use:

> "The tuck'd-up sempstress walks with lusty strides,
> While streams run down her oiled umbrella's sides."

Gay, in his *Trivia*, 1712, describes the good housewives

> "underneath th' umbrella's oily shade."

But nearly forty years later, about 1750, Jonas Hanway is described to have been the first to walk the streets of London with an umbrella over his head, which he had probably used in his travels in the East. And in 1778, one John Macdonald, a footman, was ridiculed for carrying in the streets an umbrella which he had brought from Spain; however, as he tells us, he persisted for three months in carrying his umbrella, till people took no further notice of the novelty.

THE DIVINING-ROD.

The *Virgula Divinatoria*, or Divining-rod, is far more commonly employed in our mining districts for the discovery of hidden treasure than is generally supposed. In Cornwall, not only do the miners themselves place much confidence in its indications; but very many highly intelligent men employ

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the divining-rod, or engage the diviner in seeking for mineral wealth on their estates. In Lancashire and Cumberland the belief in the powers of the magic-rod is widely spread. That, at this time of day, such should be the case, is a lamentable example of the defective character of early education. The divining-rod is a forked twig of the hazel-tree or of the white thorn. The small ends being crooked, are to be held in the hands, in a position flat or parallel to the horizon, and the upper part at an elevation having an angle to it of about seventy degrees. The rod must be grasped strongly and steadily, and then the operator walks over the ground: when he crosses a lode, its bending is supposed to indicate the presence thereof. The position of the hands in holding the rod is a constrained one—it is not easy to describe it—but the result is that the hands, from weariness speedily induced in the muscles, grasp the end of the twig yet more rigidly, and thus is produced the mysterious bending. The phenomena of the divining-rod and table-turning are of precisely the same character, and both are referable to an involuntary muscular action resulting from a *fixedness of idea*. These experiments with the divining-rod are always made in a district known to be metalliferous, and the chances therefore are greatly in favour of its bending over or near a mineral lode.—*Eclectic Review*, September 1855.

CORAL AND BELLS.

Pliny records an ancient superstition, which considered Coral an amulet or defensative against fascination. It was thought, too, to preserve and fasten the teeth in men. In a Latin work, date 1536, we read: "Wytches tell that this stone (coral) withstandeth lightenynge. It putteth of lightenynge, whirlewynde, tempeste, and stormes fro shyppes and houses that it is in." Plat, in his *Jewel Home of Nature and Art*, says: "Coral is good to be hanged about children's necks, as well to rub their gums as to preserve them from the falling sickness: it hath also some special sympathy with nature, for the best coral being worn about the neck will turn pale and wan if the party that wears it be sick, and comes to its former colour again as they recover health." Paracelsus says, that it should be worn around the necks of infants, as an admirable preservative against fits, sorcery, charms, and even against poison. It is curious that the same superstitious belief should exist among the negroes of the West Indies, who affirm that the colour of coral is always affected by the state of the health of the wearer, it becoming paler in disease. In Sicily it is also commonly worn as an amulet by persons of all ranks. In a rare work, date 1621, in a dialogue relative to the dress of a child, occurs, "Coral with the small golden chayne." The bells were added,

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not to amuse the child by their jingle, but to frighten away evil spirits,—as bells were introduced into our churches for a charm against storms and thunder and the assaults of Satan.

"LOOKING BACK."

The superstition of the ill-luck of Looking Back or returning is nearly as old as the world itself, having doubtless originated in Lot's wife "having looked back from behind him," when he was led, with his family and cattle, by an angel outside the doomed City of the Plain (Genesis xix. 26). Whether walking or riding, the wife was behind the husband, according to a usage still prevalent in the East, where no woman goes beside her husband. In Roberts's *Oriental Illustrations* it is stated to be "considered exceedingly unfortunate in Hindostan for men or women to look back when they leave their house. Accordingly, if a man goes out and leaves something behind him which his wife knows he will want, she does not call him to turn or look back, but takes or sends it after him; and, if some great emergency obliges him to look back, he will not then proceed on the business he was about to transact. If we mistake not, a similar feeling is entertained in some parts of England, though not carried so far into operation."

SPILLING THE SALT.

If we consider the sacredness attached to Salt in the early ages; its use in sacrifices and baptism, and the belief in its incorruptibility,—we shall not be surprised at the accidental Overturning of the Salt at table being thought an ill omen. Leonardo da Vinci, in his picture of the Last Supper, has represented Judas Iscariot overturning the salt—a dark foreshadowing of the betrayal of his Lord.

THE CHILD'S CAUL.

The preservative value of the Child's Caul is hardly worn out. The caul is a membrane found on some children encompassing the head when born. This is thought a good omen to the child itself: and the vulgar opinion is, that whoever obtains it by purchase will be fortunate and escape danger. Œlius Lampridius relates that Diadumenus, who came to the sovereign dignity of the empire, was *born with a caul*. This superstition was very prevalent in the primitive ages of the church; and St. Chrysostom inveighs against it in several of his homilies. In France it is proverbial. "*Etre né coiffée*" signifies that a person born with a caul, or coif, is extremely fortunate; and if he grew to be a lawyer, it presaged that he would wear the sergeant's and judge's coif; while midwives have sold cauls to advocates to make them eloquent. It has also been sold

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for magical uses. Grose says that a person possessed of a caul may know the state of health of the person who was born with it: if alive and well, it is firm and crisp; if dead or sick, it is relaxed and flaccid. In Ben Jonson's *Alchymist*, Face says, "You're born with a caul o' your head." Melton, in his *Astrologasta*, states "that if a child be born with a cawle on his head, he shall be very fortunate." Weston, in his *Moral Aphorisms from the Arabic*, 1801, says: "The caul that enfolds the birth is the powerful guardian, like the seal rings of a monarch, for the attainment of the arch of heaven, where, in the car of a bright luminary, it is crowned and revolved;" and in a note is added: "The superstition of the caul comes from the East; there are several words in Arabic for it." But the caul, thought medicinal in diseases, is also esteemed *an infallible preservative against drowning;* and is therefore to this day advertised in the newspapers for sale, especially to persons going to sea. We quote from three advertisements, omitting the addresses of reference:

"A Child's Caul for sale. Apply," &c.—*Times*, Sept. 9, 1834.

"A Child's Caul to be disposed of, a well-known preservative against drowning, &c., price 10 guineas. Address," &c.—*Times*, June 2, 1835.

"To Mariners, &c. To be sold, a Child's Caul, price 15 guineas. Apply," &c.

The price asked has often been from twenty to thirty guineas. The chief purchasers of cauls are seamen, a class of persons who, as they are more than most others exposed to danger which human foresight and exertion can hardly avert, still remain, more than others, disposed to trust to supernatural means for their safety. In Ruddiman's *Glossary to Douglas's Virgil* the caul is designated a *haly* or *sely* how, *i.e.* holy or fortunate cap or hood. Now, we are inclined to refer the caul preservative to the same superstitious idea which seems to have attached to the fact of burying a corpse in a monk's *cowl*, for which we may, among other authorities, refer to Holinshed. Speaking of the death of King John, he says: "For the manner was at that time in such sort to bury their nobles and great men, who were induced, by the imagination of monks and fond fancies of friars to believe that *the said cowl was an amulet*, or defensative to *their souls*, from hell and hellish hags, how or in whatsoever sort they died."*

Again, *cowl* and *caul* both allude to the covering of the head. The language formerly used at the English court and among the higher ranks of society was Norman-French; and, of course, with the French pronunciation, as in the diphthong *au*, pronounced *ou* or *aw*, as in Paul's, which was formerly pronounced *Powle's*.

* Quoted, by permission, from the *Family Friend*, 1855, a work of extensive circulation.

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WITCHCRAFT IN BREWING.

In a Scotch brewer's instructions for Scotch ale, dated 1793, we find this mystical note: "I throw a little dry malt, which is left on purpose, on the top of the mash, with a handful of salt, to *keep the witches from it*, and then cover it up." Perhaps this practice gave rise to indifferent beer being termed "water-bewitched."

TOUCHING FOR THE EVIL.

The Touching for Disease by the royal hand is mentioned by Peter of Blois, in the twelfth century; and it is stated to be traceable to Edward the Confessor. Sir John Fortescue, in his defence of the house of Lancaster against that of York, argued that the crown could not descend to a female, because the queen is not qualified by the form of anointing her, used at the coronation, to cure the disease called "the King's Evil." Aubrey refers to "the king's evill, from the king curing of it with his touch." This miraculous gift was almost reserved for the Stuarts to claim. Dr. Ralph Bathurst, one of the chaplains to King Charles I., "no superstitious man," says Aubrey, protested to him that "the curing of the king's evill by the touch of the king doth puzzle his philosophie; for when they were of the House of Yorke or Lancaster, it did." The solemn words, "I touch, but God healeth," were always pronounced by the sovereign when he "touched" or administered "the sovereign salve," as Bulwer calls it. Then we read of vervain root and baked toads being worn in silken bags around the neck, as charms for the evil. The practice of touching was at its height in the reign of Charles II.; and in the first four years after his restoration he "touched" nearly 24,000 persons. Pepys, in his *Diary*, June 23, 1666, records how he waited at Whitehall "to see the king touch people for the king's evil." He did not come, but kept the poor persons waiting all the morning in the rain in the garden: "afterwards he touched them in the banqueting-house." The practice was continued by Charles's successors. The Hon. Daines Barrington tells of an old man who was witness in a cause, and averred that when Queen Anne was at Oxford, she touched him, then a child, for the evil; the old man added, that he did not believe himself to have had the evil; but "his parents were poor, and he had no objection to a bit of gold." Again, Dr. Johnson, when a boy, was taken by his father from Lichfield to London, to be touched for the evil by Queen Anne, in 1712. Mrs. Bray speaks of a "Queen Anne's farthing" being a charm for curing the king's evil in Devonshire.

At a late period, the use of certain coins was in common vogue, which, being touched by the king, were supposed to have

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the power of warding off evil or scrofula. These coins are called *Royal Touch-pieces:* several are preserved in the British Museum; and Mr. Roach Smith has one which has been so extensively used that the impression is quite abraded. Mr. A. Smee has a cast of a touch-piece of the Pretender, who thought that he had a right to the English crown, and therefore had the power to confer the royal cure.

"The practice was supposed to have expired with the Stuarts; but the point being disputed, reference was made to the library of the Duke of Sussex, and four several Oxford editions of the Book of Common Prayer were found, all printed after the accession of the House of Hanover, and all containing as an integral part of the service 'the office for the healing.'"—*Lord Braybrooke's Notes to Pepys' Diary.*

CHARMING AWAY WARTS AND WENS.

The belief in *charming away* warts is considered by Dr. Burrows to be the result of the action of the mind upon the body; and he attributes the rapid change of the hair to the same cause. The very temperature of the body is changed; for heats, fear, and aversion cool. The *mal-de-pays* arises from a moral source, producing, on the evidence of physicians, positive organic effects; the lungs are found adhering to the pleura, &c. A similar explanation may be applied to persons formerly "rubbed for wens" after public executions at Newgate. Men, women, and children, thus afflicted, were introduced beneath the gallows, and elevated so as to be seen by the populace within a few minutes after the convicts had been "turned off." The hands of the corpse were untied by the executioner, and gently moved backwards and forwards for about two minutes upon the part affected, which was supposed to work a cure; but the custom has very properly been abolished as a contemptible superstition, the continuance of which it would be disgraceful to permit.

THE PHYSICIAN'S SYMBOL.

Dr. Paris tells us that the physician of the present day continues to prefix to his prescriptions the letter ℞, which is generally supposed to mean *recipe;* but which is, in truth, a relic of the astrological symbol of Jupiter, formerly used as a species of superstitious invocation. Another origin has, however, been given. At the close of the sixteenth century, Dr. Dee was, according to his own account, and we verily believe his own conviction, on terms of intimacy with most of the angels. His brother physician, Dr. Napier, got almost all his medical prescriptions from the angel Raphael; and Elias Ashmole had a manuscript volume of these receipts, filling about

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a quire and a half of paper. Now, it has been thought that the prefixed characters which Ashmole interprets to mean *Responsum Raphaelis*, remarkably resemble that cabalistic-looking R, which is to this day prefixed to medical prescriptions, but is commonly interpreted "recipe."

ORIGIN OF WAKES.

The festival of the day on which the church of any parish was dedicated is specially enjoined in the law of Edward the Confessor; and from this festival originated the wakes of more modern times: a name derived either from the verb *weiken*, to consecrate, or, as seems more probable, from the Saxon word for the vigil by which the festival was preceded. The institution of these festivals is to be traced to Gregory the Great, who advised Mellito, whom he had sent as abbot into Britain, to encourage the people to hold festivals around the churches on the days of their consecration, or of the commemoration of the martyrs whose relics were placed there, that he might prevent them from attending their idol-feasts.

An old English sermon states how the vigils were changed from feasts to fasts; how, "in the begynning of holy Church men and women comyng to church over nyghte, wit candelus and other lyghte, and woken in the church alle nyghte in her devocynes;" but, "by processe of tyme," they "turned the good holy devocyon into synne; wherefore holy faders ordeyned the people to leve that waking, and faste the evon; and so turned the wakyng into fastyng; but yett holdith the olde name, and is called in Latin vigilia, that is wakyng in Englysch." —*Hampson*, ii. 125.

THE MERRY ANDREW,

who has scarcely disappeared from the mountebank's stage, is said by Warton (*English Poetry*, vol. iii. p. 74) to have been named from the facetious physician, Andrew Borde: "'Twas from the doctor's method of using such speeches at markets and fairs, that in after-times those that imitated the like humorous jocose language were styled Merry Andrews, a term much in vogue on our stages."

ORIGIN OF JACK PUDDING.

Five countries from five favourite dishes name
The popular stage-buffoon's professional name.
Half-fish himself, the Dutchman, never erring,
From native instinct styles him *Pickle Herring*.
The German, whose strong palate *haut goûts* fit,
Calls him *Hans Werst*, that is, *John Sausage Wit*.
The Frenchman, ever prone to *badinage*,
Thinks of his soup, and shrugs, *Eh! viola Jean Potage!*

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Full of ideas his sweet food supplies,
The Italian, *Ecco Maccaroni!* cries.
While English taste, whose board with dumpling smokes,
Inspired by what it loves, applauds *Jack Pudding's* jokes.
A charming bill of fare, you'll say, to suit
One dish, and that one dish a fool to boot.—*S. Bishop.*

PUNCH AND JUDY.

Punch and Judy is the relic of an ancient mystery—*Pontius cum Judæis*, or Pontius Pilate with the Jews; particularly in reference to St. Matt. xxvii. 19.

THE SIR-LOIN OF BEEF.

There is a laughable tradition current in Lancashire, that King James I., in one of his visits there, knighted at a banquet in Houghton Tower, near Blackburn, a loin of beef, the part ever since called the *Sir-loin*. Dr. Pegge, however (*Gent. Mag.* vol. liv. p. 485), conceives the word to be "compounded of the French *sur*, upon, and the English *loin*, for the sake of euphony, our particles not easily submitting to composition. In proof of this, the piece of beef so called grows upon the *loin*, and behind the small ribs of the animal." The tradition is also related as a waggish freak of Charles II. Hence the epigram:

"Our second *Charles*, of fame facete,
On loin of beef did dine;
He held his sword pleased o'er the meat,
'Rise up thou famed Sir-loin!'"

The table upon which this burlesque ceremony was said to have been performed was shown, a few years since, at Friday Hill House, Chingford, Essex.

WALLS-END COALS.

It is curious to reflect that the above name for our every-day fuel is derived from our Roman conquerors. It appears that the eastern termination of the Great Roman Wall was midway between Newcastle-upon-Tyne and the sea, at a large colliery which has produced an excellent description of house-hold coal, therefore called *Walls-end Coal;* the high estimation of which has led to the appellation being extended to other kinds.

The coal-fields of Northumberland and Durham, from the river Coquet to the Tees, extend along the coast about 50 miles; the extreme breadth is nearly 25 miles, and the average breadth about 16 miles; total area from 700 to 800 miles. In one of these mines, the down-cast shaft (by which the air goes down) is about 68 fathoms, or 408 feet, about the height of the cross of St. Paul's Cathedral, London, and double the height of the Monument. These mines produce nearly 14 million tons of coal annually, of which 6 millions are destined for London and the coast trade.—*T. Sopwith, F.G.S.*

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THE GAME OF CURLING.

Jamieson conjectures this Scottish game to be named from the Teutonic *krollen, krullen, sinuare, flectere*, whence the English *curl;* as the great art of the game is to make the stones bend or curve in towards the mark, when it is so blocked up that they cannot be directed in a straight line.

THE GAME OF LA CROSSERIE.

This game, which may be called Hockey, is known in England, and above all at Eton, where it forms one of the principal daily amusements of the pupils during autumn, but apart from the absurd ceremonies which accompany its annual celebration on the coasts of Normandy. It is said this game is of recent Scottish origin; but the stick, in the form of a *cross*—a sacerdotal emblem—which is used in it, refers it to a source more ancient.—*Tarver.*

In Normandy, la Crosserie is played on Shrove Tuesday by the bishops, canons, and other clerical dignitaries, each with a stick having a cross at the end: sides are formed; two stones are set up, and the player who first passes a ball of box-wood between them wins the game; the signal for the commencement and close of the game being given by the great bell of the cathedral.

DURHAM MUSTARD.

Prior to the year 1720, there was no such luxury as Mustard in its present form at our tables. At that time the seed was coarsely pounded in a mortar, as coarsely separated from the integument, and in that rough state prepared for use. In the year mentioned, it occurred to an old woman of the name of Clements, residing in Durham, to grind the seed in a mill, and pass it through the several processes which are resorted to in making flour from wheat. The secret she kept for many years to herself; and in the period of her exclusive possession of it supplied the principal parts of the kingdom, and in particular the metropolis, with this article. George I. stamped it with fashion by his approval. (Hence the pots in which the mustard is sold bear the royal initials in a medallion.) Mrs. Clements twice a year travelled to London and the principal towns throughout England for orders. From her residing in Durham, the article acquired the name of "Durham mustard."

CRICKET.

This famous English sport boasts of no more ancient origin than the commencement of the last century; and the following etymology seems to be the most likely, from its close and natural resemblance, namely, from the Saxon *cryce*, a stick. We

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are, however, totally at a loss to account for a game which certainly had not its origin among the learned, receiving a name from a language now little known, except amongst a few scholars and antiquaries. Possibly cricket may have a much more ancient origin than the above; and it may have been named when it was in its infant state as *club and ball*: as such it is an *old* game. The old copper-plate etching, the *Cotswold Games*, gives all the games of the time, but nothing like this. Mr. Bonstetten, of Berne, considers it originally an Icelandic game: but that it is a gradual improvement of *club and ball* we have no doubt; for the old bat, as seen in the picture of the Pavilion in Lord's Ground, has the *bend* of the club.—*Gentleman's Magazine*, 1839.

SWAN-UPPING, OR HOPPING.

By aid of the *Loseley Manuscripts* (preserved in the muniment-room at Loseley House, in Surrey, and edited with notes by the late M. A. J. Kempe, F.S.A.) we learn that the above custom was the taking of Swans upon rivers for the purpose of affixing certain marks to their beaks. Its superintendence was intrusted to a person officially appointed Master of the Swans, who, in the reign of Queen Elizabeth, was Sir William More, then owner of Loseley. Among the Mss. there has been found *an original roll of Swan-marks*, showing the beaks of the swans to have been notched with stars, chevrons, crosses, the initials of the owners' names, or other devices. Thus in the above roll are given the marks used for the swans of Lord William Howard, Lord Buckhurst, Sir Henry Weston, Francis Carew, Esq., William More, Esq., and other principal persons resident in Surrey; likewise the marks of the Dyers' and Vintners' Companies, who to this day keep swans upon the Thames.

CROSS AND PILE.

The origin of this name of the old game corresponding to "head or tail" of the present day, has been much disputed; but the following explanation is, to our thinking, satisfactory:

"The word *coin* itself is money struck on the *coin* or head of the flattened metal, by which word *coin*, or *head*, is to be understood the *obverse*, the only side which, in the infancy of coining, bore the stamp. Thence the Latin *cuneus*, from *cune*, or *kyn*, the head.

"This side was called also *pile*, in corruption from *poll*, a head, not only from the side itself being the *coin* or *head*, but from its being impressed most commonly with some head in contra-distinction to the reverse, which, in later times, was oftenest a cross. Thence the vulgarism, *cross* or *pile, poll, head.*"—*Cleland's Specimen of an Etymological Vocabulary*, p. 157.

Kelham, in his Norman-French Dictionary, has: "*Pille*, pile; that side of the coin which bears the head. Cross or

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pile, a game." The following extracts from a Ms. of the private expenses of Edward II. shows this to have been a favourite royal game in his time:

"*Item.* Paid to the King himself, to play at cross and pile, by the hands of Richard de Mereworth, the receiver of the treasury, twelvepence.

"*Item.* Paid there to Henry, the King's barber, for money which he lent to the King, to play at cross and pile, five shillings."

LIVERY AND LIVERY STABLES.

Livery, *i.e.* delivery, is from the French *livrer*, to deliver. Chaucer has, "the conisance of my livery to all my servants *delivered*." Spenser, in his work on Ireland, says: "What *livery* is, we, by common use in England, know well enough, namely, that it is allowance of horse-meate, as they commonly use the word in stabling, as to keepe horses at *livery;* the which word, I guess, is derived of *livering* or delivering forth their nightly food. So, in great houses, the livery is said to be served up for all night, that is, their evening's allowance for drinke. And livery is also called the upper weede which a serving-man weareth, so called (as I suppose) for that it was delivered and taken from him at pleasure."

TAILORS' "CABBAGE."

The word Cabbage, by which all the varieties of *Brassica* are now called, means the firm head or ball that is formed by the leaves turning closely over each other; from which circumstance we say the cole has cabbaged, the lettuce has cabbaged, the tailor has cabbaged. Arbuthnot, in his *History of John Bull*, says: "Your tailor, instead of shreds, cabbages whole yards of cloth." Hence arose the cant word applied to tailors, who formerly worked at the private houses of their customers, where they were often accused of *cabbaging*, *i.e.* rolling up pieces of cloth, instead of the list and shreds which they claimed as their due.

RICHMOND "MAIDS OF HONOUR."

These are delicious cheese-cakes, peculiar to Richmond in Surrey, and doubtless named from its regal days, when Richmond had its royal palace and court. It is stated that one thousand pounds was once paid to the fortunate possessor of the receipt for making this cheese-cake, with the good-will of the business, said to have been originally established in Hill Street, Richmond. George III. had his tables at Windsor Castle and Kew regularly supplied with these cheese-cakes.

THE GORDIAN KNOT

is named from this incident in classic history. Gordius (a king

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of Phrygia Major), being raised from the plough to the throne, placed the harness, or furniture, of his wain and oxen in the temple of Apollo, tied in such a knot that the monarchy of the world was promised to him that could untie it; which, when Alexander, that "tumour of a man," had long tried, and could not do, he cut it with his sword.

"BY HOOK OR BY CROOK."

This proverb is said to have arisen in the time of Charles I., when there were two learned judges, Hooke and Crooke, and a difficult cause was to have been gotten either by Hooke or by Crooke. Spenser, however, mentions these words twice in his *Faery Queene*, which is a proof that this proverb is much older than that time; and that the phrase was not then used as a proverb, but applied as a pun.—*Warton.*

LUCK OF HORSE-SHOES.

Butler, in *Hudibras*, says of his conjuror, that he could

> "Chase evil spirits away by dint
> Of sickle, *horse-shoe*, hollow flint."

Aubrey, in his *Miscellanies*, tells us that

"It is a thing very common to nail horse-shoes on the thresholds of doors; which is to hinder the power of witches that enter the house. Most of the houses of the west-end of London have the horse-shoe on the threshold. It should be a horse-shoe that one finds." He adds, "Under the porch of Stanfield Church, in Suffolk, I saw a tile, with a horse-shoe upon it, placed there for this purpose, that one would imagine that holy water alone would have been sufficient. I am told there are many more instances."

In Gay's fable of "The Old Woman and her Cats," the supposed witch complains:

> "Straws laid across my path retard,
> *The horse-shoe's nail'd, each threshold's guard.*"

In Monmouth Street, probably one of the localities alluded to by Aubrey (then a fashionable neighbourhood), many horse-shoes, nailed to the thresholds, were to be seen in 1797; in 1813, Sir Henry Ellis counted seventeen horse-shoes in Monmouth Street; in 1852, only eleven remained.

It was once thought lucky to find old iron, but more especially a horse-shoe. This notion has been current in our time, as well as the nailing of the shoes in front of the sill and *over* the doorway, in Sussex; where, in childhood, we have more than once accounted ourselves lucky in finding a horse-shoe.

Nelson was of a superstitious turn, had great faith in the luck of a horse-shoe, and one was nailed to the mast of the ship *Victory*. "Lucky Dr. James" attributed the success of his fever-powder to his finding a horse-shoe.

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When Dr. James, then a poor apothecary, had invented the fever-powder, he was introduced to Newbery, of St. Paul's Churchyard, to vend the medicine for him. One Sunday morning, as James was on his way to Newbery's country-house at Vauxhall, in passing over Westminster Bridge, seeing a horse-shoe lying in the road, and considering it to be a sign of good luck, he put the shoe into his pocket. As Newbery was a shrewd man, he became James's agent for the sale of the fever-powder; whilst the doctor ascribed all his success to the horse-shoe, which he subsequently adopted as the crest upon his carriage.

The Magpie is a bird of omen, and is associated with the lucky horse-shoe in the well-known public-house sign.

CRITICAL DAYS.

Great attention was paid to certain days, in the progress of acute diseases, by the ancients, and by the learned and well-informed among the moderns. Dr. Cullen, in particular, considers the observations of the ancients as correct; and in fevers, points out the seventh, ninth, eleventh, fourteenth, seventeenth, and twentieth days as critical. From the writings of physicians, the words *crisis* and *critical* have got into common language, with the meaning a little altered.

WHAT IS QUACKERY?

The appellation of quack, says Dr. Parr, arose from *quacksalber*, the German name for quicksilver; since, on the first appearance of syphilis, the irregular practitioners only employed this reputedly dangerous medicine. At present the term *quack* is confined to those who sell a pretended nostrum, the preparation of which is kept secret; but it may be applied to every practitioner who, by pompous pretences, mean insinuations, and indirect promises, endeavours to obtain that confidence which neither success nor experience entitles him to.—*Dr. Macaulay's Dictionary of Medicine*, 12th edit. 1854.

The term quack, to brag loudly, is as old as the time of Butler:

> "Believe mechanick virtuosi
> Can raise them mountains in Potosi,
> Seek out for plants with signatures,
> To quack of universal cures."—*Hudibras.*

The general application of the term to boastful pretenders is also old; for Sir R. l'Estrange speaks of "the change, schools, and pulpits," being "full of quacks, jugglers, and plagiaries." Johnson gives *quacksalver*, from *quack* and *salve*, and illustrates from Brown and Burton.

Useful and esteemed remedies have at first appeared in the disreputable form of secret remedies. Such was Dover's powder (opium and ipecacuanha), named from its inventor, who published it at first with an air of mystery, hitching in a line of Pope:

> "See, desperate misery lays hold on Dover."

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James's powder (antimonial) was first compounded by Dr. James, the early friend of Dr. Johnson, at Lichfield; the specification of the original medicine has all the ambiguity of an ancient oracle. Ward's remedies were invented by one Ward, originally a footman, who, during his attendance upon his master on the continent, obtained from some monks those receipts which afterwards became his nostrums.

"DEAD AS A DOOR-NAIL."

This proverbial expression is taken from the door-nail: that is, the nail on which, in old doors, the knocker strikes. It is therefore used as a comparison to any one irrecoverably dead; one who has fallen (as Virgil says) *multa morte, i.e.* with abundant death, such as reiteration of strokes on the head would naturally produce:

> "*Falstaff.* What! Is the old king dead?
> *Pistol.* As nail in door."—*Shakspeare's Henry IV.*

"THROWING A TUB TO THE WHALE"

originated in the practice of the sailors of Greenland and South-Sea whaling ships, when surrounded with a dangerous number of whales, throwing out a tub to divert their attention; meanwhile every sail is hoisted, and the vessel pursues its course. This is one of the illustrations of Swift's *Tale of a Tub.* In argument, to give an adversary a pretended advantage, to mislead him, is to throw a tub to the whale.

"THIRTEEN TO DINNER."

There is a prejudice existing, generally, on the pretended danger of being the thirteenth at table. If the probability be required, that out of thirteen persons of different ages one of them at least shall die within a year, it will be found that the chances are about one to one that one death at least will occur. This calculation, by means of a false interpretation, has given rise to the prejudice, no less ridiculous, that the danger will be avoided by inviting a greater number of guests, which can only have the effect of augmenting the probability of the event so much apprehended.—*Quetelet, on the Calculation of Probabilities.*

This superstition obtains in Italy and Russia, as well as in England. Moore, in his *Diary*, vol. ii. p. 206, mentions there being thirteen at dinner one day at Madame Catalani's, when a French countess, who lived with her upstairs, was sent for to remedy the grievance. Again, Lord L. said he had dined once abroad at Count Orloff's, who did not sit down to dinner, but kept walking from chair to chair, because "the Naristiken were at table, who, he knew, would rise instantly if they perceived the number *thirteen*, which Orloff would have made by sitting down himself."

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The Calendar.

THE CENTURY.

We agree with Professor de Morgan, that "it is to be regretted that we are obliged to talk of centuries under *numeral* figures which contradict the dates. *Fourteen* hundred and twenty is the *fifteenth* century. We are always obliged to pause a moment before we put a year into its century: and even practised historical writers sometimes make a slip. The second edition of Mr. Macaulay's Essays is their third impression; and yet (vol. ii. p. 15) it is said: 'We know that during the fierce contests of the *sixteenth* century, both the hostile parties spoke of the time of *Elizabeth* as a golden age.' The italics, of course, are our own."—Note to *Companion to the Almanac*, 1850.

THE SABBATH AND SUNDAY.

Foremost in the list of Festivals stands the Lord's-day, or Sunday; "the day of the resurrection, the queen, the chief of all days, in which our life arose, and the victory over death was gained by Christ;" the day also in which as Justin the martyr urges, God, out of darkness and the primal matter, formed a world. The only words used in English for the first day of the week, before the existence of Puritanism, were *Sunday* and *Lord's Day*. The former of these expressions we retained from our Saxon ancestors, with all other Teutonic nations. The latter we adapted from the Christian form of Southern Europe.

Saturday, in Italian, still retains the Hebrew name of *Sabbata;* so it is, with the slight literal variations which distinguish the several languages, in Spanish and Portuguese. The French *Samedi* is properly explained by Menage as merely an abridgment of *Sabbati-di*, just as *Mardi* is of *Marti-di*, and *Vendredi* of *Veneri-di*.

Disraeli, in his *Commentaries on the Life of Charles I.*, fixes the reign of Elizabeth, and the year 1564, as the period when Sunday was first called Saturday (dies Sabbati). Hence arose the reformers of the reformed, the Sabbatarians, of which new doctrine John Knox was the true father in England, although Knox was the bosom friend of Calvin.—Abridged from *Notes and Queries*, No. 299.

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LEAP YEAR.

The privilege of ladies choosing husbands is thus explained in a work entitled *Courtship, Love, and Matrimonie*, printed in the year 1606: "Albeit it is nowe become a part of the common lawe in regard to social relations of life, that as often as every bissextile year dost return, the ladyes have the sole privilege, during the time it continueth, of making love unto the men, which they doe either by wordes or lookes, as to them it seemeth proper; and, moreover, no man will be entitled to the benefit of clergy who dothe refuse to accept the offers of a ladye, or who dothe in any wise treate her proposal withe slight or contumely."

CANDLEMAS

is evidently traceable to the ancient custom of lighting up churches and chapels with Candles and lamps, and carrying them in procession. This practice of lighting has been discontinued in this country since the second year of Edward VI.; in the Romish Church the original name, and all its attendant ceremonies, are still retained. Herbert, in his *Country Parson*, refers to a relic of this practice in the custom of saying, "when light is brought in, *God sends us the light of Heaven*,—and the parson likes this very well. Light is a great blessing, and as great as food, for which we give thanks; and those that think this superstitious, neither know superstition nor themselves."

PANCAKES ON SHROVE-TUESDAY.

Taylor, the Water-poet, writing in 1630, says: "Shrove-Tuesday, at whose entrance in the morning all the whole kingdom is in quiet; but by the time the clock strikes eleven, which, by the help of a knavish sexton, is commonly before nine, then there is a bell rung, called 'the Pancake Bell,' the sound of which makes thousands of people distracted, and forgetful either of manners or humanity; and then there is a thing called wheaten flour, which the cooks do mingle with water, eggs, spice, and other tragical and magical enchantments; and then they put it by little and little into a frying-pan of boiling suet, where it makes a confined dismal hissing, like the Lethean snakes in the reeds of Acheron, Styx, or Phlegethon, until at last, by the skill of the cook, it is transformed into the form of a flip-jack, called a pancake, which, with ominous incantations, the ignorant people do devour very greedily."

LENT.

Lent is commonly said to be named from a Saxon word for

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Spring. It was originally called Quadragesima, and only lasted forty hours, from twelve on Good Friday to Easter morn; but it was gradually extended to forty days, after the fasts of Moses (Deut. ix.); of Elijah (1 Kings xix.); of the Ninevites (Jonah iii.); and of our Lord himself (Matt. iv.); all of which fasted forty days. This fast begins on Wednesday, because the six Sundays being festivals, were not included in the fasting-days; and therefore, unless four days were added before the first Sunday in Lent, the fast would only last thirty-six days instead of forty.—*Elementa Liturgica.*

Ash Wednesday, the first day of Lent, originated in the blessing of ashes on that day, "to put in remembrance every Christian man, the beginning of Lent and Penance, that he is but ashes and earth, and thereunto shall return;" and the ceremony was reserved at the Reformation.

Mid-Lent, the fourth Sunday in Lent, was anciently kept by Roman Catholics visiting their mother-church, and making their offerings at the high altar. Thence arose the dutiful custom of visiting parents on this day, therefore called *Mothering Sunday;* when the children were treated with a regale of excellent frumenty, or they presented their *mother* with a sum of money, a trinket, &c. On the following Sunday, preceding Palm Sunday, fried peas, or *carlings*, are eaten in the North.

WEARING THE LEEK ON ST. DAVID'S DAY.

This custom is derived from one of those victories which have so often graced the arms of Wales when at war with France. The engagement was one in which the Welsh bore a distinguished part, and Shakspeare has thus put the circumstances into the mouth of Fluellen in *Henry V.* act iv. sc. 7:

"*Flu.* Your grandfather of famous memory, an't please your majesty, and your great uncle, Edward the plack prince of Wales, as I have read in the Chronicles, fought a most prave pattel here in France.

K. Henry. They did, Fluellen.

Flu. Your majesty says very true. If your majesty is remembered of it, the Welshmen did goot service in a garden *where leeks did grow*, wearing *leeks* in their Monmouth caps; which, your majesty knows, to this hour is an honourable padge of the service; and, I do believe, your majesty takes no scorn to wear the *leek* upon Saint Tavy's-day.

K. Henry. I wear it for memorable honour."

This must have been the battle of Poictiers. John of Gaunt (then Earl of Richmond) was about seventeen years old; and as this is the only battle answering the description at which both could have been present, it is concluded to be the one intended in the above quotation. The Welsh archers had also signalised themselves at the battle of Cressy; so that the *leek* may be deemed a memorial, and the only one still worn, of two

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of the most glorious victories that ever graced the British arms, as well as of the part which the Welsh had the honour of bearing in the success.—*The Rev. Peter Roberts's Popular Antiquities of Wales.*

MAUNDY THURSDAY,

the day preceding Good Friday, is named from *dies mandati*, the day of command, on which day our Saviour gave his great mandate, that we should love one another; or it is supposed to be from the Saxon *maund*, an alms-basket, because on that day princes used to give alms to the poor from their basket;* and those who partook of its contents were called *maunders*.

In Whitehall Chapel, on Maundy Thursday, is distributed by the Queen's Almoners the Royal Bounty to as many poor aged men and women as the sovereign is years of age. The alms-money consists of sovereigns, and silver pieces of 4*d.*, 3*d.*, 2*d.*, and 1*d.* value (*Maundy Money*), in purses and red and white leather bags, carried in alms-dishes by Yeomen of the Guard, preceded by the Almoners. The distribution takes place at the conclusion of the first lesson of the Morning Service, during the singing of anthems; the purses are given to the women, and the leathern bags, with stockings, shoes, and broadcloth, to the men. The service is then proceeded with, and concludes with a prayer for the Queen. The Maundy gift to each person, in coin and clothing, amounts to about 5*l.*; and it is extended to the pensioners of previous years. The gold is put in the red bags, the silver in the white. Formerly bread, meat, and fish were also distributed in large wooden bowls, and the officers carried bouquets of flowers and wore white scarves and sashes; but the earliest custom was the sovereign washing with his or her own hands the feet of as many poor men as he or she was years old, in imitation of the humility of the Saviour.† The last sovereign who performed this was James II., in the ancient chapel at Whitehall.—*Curiosities of London.*

King William III. left the washing to his almoner: such was the arrangement for many years; but the washing has long been discontinued altogether, and since the present reign an additional sum of money has been given instead of provisions.

The Maundy Money is struck at the Royal Mint; and the pieces are, by an order of Government, declared current coins of the realm; no one, therefore, can legally refuse to take them if they are tendered in payment, although they are not in reality intended for that purpose. As a proof of this, the new groat will be found, on examination, to be from the die of the Maundy threepence, that is, the head side; but it has a different reverse, and is thicker, and of course of the weight of the Maundy four-pence. They are struck chiefly as presents for various officers attached to the Crown, as well as to others.—*Till's Essay on the Roman Denarius, &c.*

* *Maund* is still used in Scotland for a hand-basket.

† The ceremony is still literally observed at Vienna. On Maundy Thursday (March 20th, 1856), "the washing of feet" took place in the chapel which is attached to the imperial palace. His majesty the Emperor of Austria, after having served them at table, poured water over and wiped the feet of twelve of the oldest poor citizens in the city.

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GOOD-FRIDAY CROSS BUNS.

Hot Cross Buns are in England so intimately associated with our observance of Good Friday, that we do not attach to them higher antiquity. But the cross has been used as a sacred symbol from the earliest times of the ancient Egyptians, and the word *bun* is derived from the early Greeks. It was a sacred cake, marked with the cross, as depicted in Greek sculptures and paintings. Winckelmann also relates the discovery of two perfect buns at Herculaneum; each was marked with a cross, within which were four other lines. Hesychius describes the *boun* as a kind of cake, with a representation of two horns. It is mentioned in the same terms by Julius Pollux. Diogenes Laertius describes "a sacred libra," called a *boun;* and Cecrops is said to have first offered up this sweetbread, made of flour and honey. Descending to the earlier Catholic times, we find that buns were the Eulogiæ, or consecrated loaves, made from the dough whence the host itself was taken, and given by the priests to the people; they were marked with the cross, as our Good-Friday buns are.—*Fosbroke.*

Formerly in England the superstitious preserved Good-Friday buns from year to year from the belief of their efficacy in the cure of diseases. And Poor Robin, in his almanac for 1753, says:

"Whose virtue is, if you believe what's said,
They'll not grow mouldy like the common bread."

THE DANCING SUN.

There was a superstition, once very prevalent in England, that on Easter-day the Sun danced at sunrise; an idea used as a comparison by Sir John Suckling, in one of his verses, eulogising a belle of the day:

"Her feet beneath her petticoat
Like little mice peep'd in and out,
As if they feared the light;
And oh! she dances such a way—
No sun upon an Easter-day
Were half so fine a sight."

GOSPEL-OAKS

are traditionally said to have been so called in consequence of its having been the practice in ancient times to read under a tree which grew upon a boundary-line a portion of the Gospel on the annual perambulation of the bounds of the parish on Ascension Day. Again, these ancient trees were probably Druidical; and under their "leafy tabernacles" the first Christian missionaries preached. In the 502d poem of Herrick's *Hesperides* occur these lines:

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"Dearest, bury me
Under that holy oak, or gospel-tree,
Where, though thou see'st not, thou mayst think upon
Me when thou yearly go'st in procession."

The pagan practice of worshipping the gods in woods and trees continued for many centuries, till the introduction of Christianity; and the converters did not disdain to adopt every means to raise Christian cultus (worship) to higher authority than that of paganism by acting upon the senses of the heathens.

RAINY SAINTS' DAYS.

Churchill thus glances at the superstitious notions about Rain on St. Swithin's Day (July 15):

"July, to whom the Dog-star in her train
St. James gives oysters, and St. Swithin rain."

Gay, in his *Trivia*, mentions:

"How if on Swithin's Feast the welkin low'rs,
And every penthouse streams with hasty show'rs,
Twice twenty days shall clouds their fleeces drain,
And wash the pavements with incessant rain."

There is also an old proverb:

"St. Swithin's Day, if thou dost rain,
For forty days it will remain:
St. Swithin's Day, if thou be fair,
For forty days 'twill rain na mair."

There is a quaint saying, that when it rains on St. Swithin's Day, it is the saint christening the apples. In some church-books there are entries of gatherings of "Sainte Swithine's farthyngs" on this day. St. Swithin was *Chancellor of the Exchequer* in the time of King Ethelbert, and the great patron-saint of the cathedral and city of Winchester. In the former is shown a large sculptured stone, which was long believed to cover the remains of the Saxon saint; but this was disproved in 1797 by the finding of a complete skeleton beneath the stone; and the skull of St. Swithin is known to have been deposited in Canterbury Cathedral. His shrine was formerly kept in a chapel behind the altar in Winchester Cathedral.

With respect to "Rain on St. Swithin's Day," Mr. Howard, the meteorologist, observes: "The notion commonly entertained on this subject, if put strictly to the test of experience *at any one station* in this part of the island (London), will be found fallacious. To do justice to popular observation, I may now state, that in the majority of our summers a showery period, which, with some latitude as to time and circumstances, may be admitted to constitute daily rain for forty days, does come on about the time indicated by this tradition; not that any long space before is often so dry as to mark distinctly its commencement."

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St. Simon and St. Jude's Feast (October 28) was superstitiously considered rainy, as well as that of St. Swithin; and this probably because the autumnal rains began on or about that day. In an old play occurs: "I know it as well as I know 'twill rain on Simon and Jude's Day." In another old play occurs: "Now a continued Simeon and Jude's rain beat all your feathers as flat down as pancakes." And we learn from Holinshed that, in 1536, when a battle was appointed to have been fought upon this day between the king's troops and the rebels in Yorkshire, so great a quantity of rain fell upon the eve thereof as to prevent the battle from taking place.

LAMMAS DAY.

Gule of August, or Lammas Day, is variously explained. *Gule*, from the Celtic or British *wyl* or *gule*, signifies a festival or holiday, and explains gule of August to mean the holyday of St. Peter ad Vincula in this month, when the people of England, in Roman Catholic times, paid their Peter-pence. *Lammas* is by some derived from lamb-masse, because on that day the tenants who held lands of the cathedral church in York, which is dedicated to St. Peter ad Vincula, were bound by their tenure to bring a live lamb into the church at high mass. Others derive it from a Saxon word signifying *loaf-mass* or *bread-mass;* because on this day our forefathers made an offering of bread from new wheat. Blount says: "Lammas Day, the 1st of August, otherwise called the *gule* or *yule* of August, which may be a corruption of the British word *Gwul Awst*, signifying the 1st of August." Blount further says that Lammas is called *Alaf-mass*, that is, loaf or bread mess, which signifies a feast of thanksgiving for the first fruits of the corn. It was observed with bread of new wheat; and in some places tenants were bound to bring new wheat to their lord on or before the 1st of August. New wheat is called Lammas wheat. Vallancey affirms that this day was dedicated to the fruits of the soil; that *Laeith* was the day of the obligation of grain, particularly of wheat; and that *mas* signifies fruit of all kinds, especially the acorn, whence the word *mast*.

Lammas is one of the four cross quarter-days of the year, as they are now denominated: Whitsuntide was formerly the first, Lammas the second, Martinmas the third, and Candlemas the last. Some rents are yet payable at these ancient quarter-days in England, and they continue general in Scotland.

In the parish of St. Luke were formerly "the Lotts," Lammas land, for ages appurtenant to the manor of Chelsea. The lord of the manor possessed the right of letting the land on lease for the spring and summer quarters, beginning with March and ending in August; and the inhabitants at large enjoyed the privilege of turning in their cattle from August till February, being the autumn and winter quarters. This

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state of appropriation continued till the year 1825 or 1826, when the directors of the Kensington Canal Company took possession of them for their own use immediately upon the completion of their canal; they have illegally detained them ever since, and have let them successively to several persons and received rent for the same. The Chelsea Lammas lands had hitherto been opened on the 12th of August, being the first of the month according to the old style. The graziers, butchers, and others, with their cattle, used formerly to assemble in the lane leading to "the Lotts," on the eve of Lammas, and when the clock had struck twelve, they entered the meadow.

"OYSTER DAY."

On St. James's Day (July 25, old style) oysters came in in London; and there is a popular notion that whoever eats oysters on that day will never want money for the rest of the year. Yet this does not accord with another popular conceit, in Butter's *Dyet's Dry Dinner*, 1599: "It is unseasonable and unwholesome in all months that have not an *r* in their name to eat an oyster."

The diligent antiquary, Mr. Thoms, considers that in the grotto formed of oyster-shells and lighted with a votive candle, to which, on old St. James's Day (August 5), the passer-by is entreated to contribute, by cries of "Pray remember the grotto," we have a memorial of the world-renowned shrine of St. James at Compostella, which may have been formerly erected on the anniversary of St. James by poor persons, as an invitation to the pious who could not visit Compostella to show their reverence to the saint by alms-giving to their needy brethren. Oysters are allowed to be sold in London (which city, by the way, levied a tax of 2*d.* on every person going and returning by the river Thames on pilgrimage to the shrine of St. James) after St. James's Day.—*Notes and Queries*, No. 1.

HARVEST CUSTOMS.

Harvest-home, from the Saxon *hærfest*, *q.d.* herb-feast, is defined by Ash to be "the last load of the harvest, the feast at the end of the harvest; a song sung at the end of the harvest; the opportunity of gathering harvest-treasure." With us, the festival is doubtless as old as agriculture. Harvest-home customs include "the Queen of Harvest," who was anciently brought home with the last load of corn; though an image was formerly thus richly dressed up, to represent the Roman Ceres, as recorded by Hentzner, in 1598, in a harvest-home at Windsor. Here, too, were the pipe and tabor, the latter taken from the timbrel of Miriam, as an accompaniment to her song and victory after the passage of the Red Sea. Bloomfield has left us a picture of harvest-home in Suffolk, where the foremost man in the field was honoured with the title of "lord;" and at "the Horkey," or harvest-home feast, he collected

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money from the farmers and visitors, to make a "frolic" afterwards, called the "largess" spending. But in Bloomfield's time this custom was going fast out of use. In his ballad the "Horkey," he sings:

> "Home came the jovial *Horkey load,*
> Last of the old year's crop;
> And Grace among the green boughs rode
> Right plump upon the top."

St. Roch's Day (August 16) was formerly celebrated as a general harvest-home in England. Sir Thomas Overbury (1630) under the Franklin, says: "he allows of honest pastime, and thinkes not the bones of the dead any thing bruised, or the worse for it, though the country lasses dance in the churchyard after even-song. Rock Monday, and the wake in summer, shrovings, the wakeful ketches on Christmas Eve, the hoky, or seed-cake, these he yeerely kepes, yet holds them no reliques of Popery."

"BARTHOLOMEW PIGS."

These were roasted pigs, which were formerly among the chief attractions of Bartholomew fair, in Smithfield, where they were sold piping hot in booths and on stalls. Hence "a Bartholomew pig" became a common subject of allusion and comparison. Falstaff calls himself "a little tiddy Bartholomew boar-pig." A pig-woman is also an important character in Ben Jonson's play of *Bartholomew Fair.* Dr. Johnson thought the Bartholomew pigs were the paste-pigs sold in the streets to children in his time; but Nares emphatically states they were "substantial, real, hot roasted pigs." The paste-pigs, filled with grocers' currants, and a currant for each eye, lasted to our time; we remember often to have seen them for sale upon Old London Bridge.

EATING GOOSE ON MICHAELMAS-DAY.

Although this custom can be traced through more than three centuries, its origin has not been decided by antiquaries. The commonly received belief is, that a goose, forming part of the royal dinner when the news was brought to Queen Elizabeth of the defeat of the Spanish Armada, her chivalrous majesty commanded that the dish (a goose) might be served up on every 29th of September, to commemorate the above glorious event. Mr. Douce saw this statement "somewhere" (such is his expression); but Mr. Brand thinks this rather to be a stronger proof that the custom prevailed at court in Queen Elizabeth's time. It can, however, be traced to the previous century; since bringing a goose "fit for the lord's dinner" on this day appears to have been customary in the

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time of Edward IV.; and that it was common before the Armada victory is shown in the following passage from Gascoigne, who died in 1577, or eleven years before the above event:

"And when the tenanntes come to pay their quarter's rent,
They bring some fowle at Midsummer, a dish of fish at Lent;
At Christmas a capon, *at Michaelmas a goose;*
And somewhat else at New Yere's tide, *for feare their lease flies loose.*"

Beckwith, in his edition of Blount's *Tenures*, says: "Probably no other reason can be given for this custom but that Michaelmas-day was a great festival, and geese at that time were most plentiful."

The origin of the saying, that "if you eat goose on Michaelmas-day you will never want money all the year round," is thus explained in the *British Apollo:*

"The custom came up from the tenants presenting
Their landlords with geese, to incline their relenting
On following payments."

Again:

"For doubtless 'twas at first design'd
To make the people seasons mind,
That so they might apply their care
To all those things which needful were;
And by a good industrious hand
Know when and how t' improve their land."

Goose is not eaten specially on Michaelmas-day in France. But upon St. Martin's Day they eat goose and turkey at Paris; and goose upon Twelfth-day and Shrove Tuesday. In Denmark, where the harvest is later than in England, every family who can obtain it has a roasted goose for supper on St. Martin's Eve.

THE MISTLETOE AT CHRISTMAS.

The name of this plant is derived by Johnson from *mysteltan*, Saxon; *mistel*, Danish, birdlime; and *tan*, a twig. It is a parasitic plant, found wild in England, very rarely in Scotland, and nowhere in Ireland; and is a production of great interest to the phytologist. The seeds in germination offer an exception to a general law, that the radicle of the embryo shoots downwards, and the plumula upwards. Thus, if a cannon-ball, to which mistletoe-seeds are glued on all sides, be suspended by a cord some distance from the earth, both the upper and under seeds, as well as those at the sides, all direct their radicle to the surface of the ball. This property ensures their growing upon the branches of trees, to whatever side they happen to stick. Dutrochet ascribes this peculiarity to the tendency of the radicle of mistletoe to avoid light: he attached seeds to the inside of a square of glass in a window, when the

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radicles were all directed to the interior of the apartment; he then glued others upon the outside of the squares, and they turned their radicles down upon the glass, thus directing themselves towards the dark interior.

"Misseltoe groweth chiefly upon crab-trees, apple-trees, sometimes upon hazles, and rarely upon oaks; the misseltoe whereof is counted very medicinal: it is ever green, winter and summer, and beareth a white glistening berry; and it is a plant utterly different from the plant upon which it groweth."—*Bacon.*

The fruit, which is covered with a viscid pulp, is made by the Italians, and even in Herefordshire, into a kind of bird-lime; and, as it is a favourite food of the large or *missel* thrush, it is thought to have given rise to the proverb, "Turdus malus sibi cacat," applied to such as are authors of their own misfortunes. Mistletoe grows luxuriantly upon the apple or pear tribe of trees, and the oak; and Mr. Jesse describes it as flourishing upon some lime-trees in Datchet Mead, just as Shakspeare described it in his day.

The mystic uses of the mistletoe are traced to the pagan ages: it has been identified with the golden branch referred to by Virgil, *in infernis;* and it is affirmed to have been used in the religious ceremonies of the Greeks and Romans. Sir James E. Smith thus points out the distinctness of the mistletoe of the ancients from our own:

Loranthus Europæus seems to be the original or most common mistletoe of the Greeks, which grows usually on some kind of fir-tree. But our *viscum album* is likewise found in Greece, though rarely, growing on the oak; and this has been preferred from the most remote antiquity. Hence, when the superstitions of the east travelled westward, our Druids adopted a notion of the mistletoe of the oak being more holy or efficacious, in conjurations or medicine, than what any other tree afforded; the *Loranthus,* or ordinary mistletoe, not being known there. This superstition actually remains; and a plant of viscum gathered from oak is preferred by those who rely on virtues which perhaps never existed in any mistletoe whatever."

The Druids and Celtic nations called it *all-heal* and *guidhel.* They had an extraordinary veneration for the number *three,* says Vallancey, and they chose the mistletoe, because not only its berries, but its leaves also, grow in clusters of three united to one stalk; but the leaves grow in pairs only. The Druids celebrated a grand festival on the annual cutting of the mistletoe, which was held on the sixth day of the moon nearest their new year. Many ceremonies were observed: the officiating Druid being clad in white, cut the plant with a golden sickle, and received it in a white cloth.

Stukeley, however, says, that the Druids "cut the mistletoe with their upright hatchets of brass, called celts, put upon the ends of their staffs; and they carried the mistletoe in

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their hands, and laid it on their altars, as an emblem of the salutiferous advent of Messiah." He adds:

> The custom is still preserved in the North, and was lately at York on the eve of Christmas-day: they carry mistletoe to the high altar of the cathedral, and proclaim a public and universal liberty, pardon, and freedom to all sorts of even inferior and wicked people at the gates of the city, towards the four quarters of heaven.

In the Scandinavian mythology, the mistletoe is dedicated to its Venus, Friga; and previous to the introduction of Christianity, the feast of Thor was celebrated by the Northmen at nearly the same period,—a fact which accounts for the bacchanalian character of the Christian feast.

Again, "*Geriothel*, mistletoe, a magical shrub, appeared to be *the forbidden tree in the middle of the trees of Eden;* for in the Edda the mistletoe is said to be Balder's death, who yet perished through blindness and a young woman."

The Druids doubtless dispensed the plant at a high price; "as late as the seventeenth century peculiar efficacy was attached to it, and a piece hung round the neck was considered a safeguard against witches."—*W. Sandys, F.S.A.*

Kissing a fair one under the mistletoe, and wishing her a happy new year as you present her with one of the berries for luck, is the Christmas custom of our times; and in some places persons try lots for the bough with most berries by the crackling of leaves and berries in the fire.

But at what period came mistletoe to be recognised as a Christmas evergreen? We have Christmas carols in praise of holly and ivy of even earlier date than the fifteenth century; but allusion to mistletoe can scarcely be found for two centuries later, or before the time of Herrick:

> "Down with the rosemary, and so;
> Down with the baies and mistletoe;
> Down with the holly, ivie, all,
> Wherewith ye drest the Christmas hall."

Shakspeare describes:

> "The trees, though summer, yet forlorn and lean,
> O'ercome with moss and baleful mistletoe."

Tusser directs:

> "Get ivye and hull (holly), woman, deck up thine house;"

And thus refers to the plant:

> "If snowe do continue, sheepe hardly that fare
> Crave mistle and ivie for them for to spare."

Coles, in his *Knowledge of Plants*, 1656, says of mistletoe: "it is carryed many miles to set up in houses about Christmas time, when it is adorned with a white glistening berry." In the tract, *Round about our Coal Fire, or Christmas Entertain-*

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ments, early in the last century, "the rooms were embowered with holly, ivy, cypress, bays, laurel, and mistletoe, and a bouncing Christmas log in the chimney." Gay, in his *Trivia*, book ii. 437, thus refers to the decking of churches:

> "When rosemary and bays, the poet's crown,
> Are bawl'd in frequent cries through all the town;
> Then judge the festival of Christmas near,—
> Christmas, the joyous period of the year;
> Now with bright holly all the temples strow,
> With laurel green and sacred mistletoe."

Mr. Brand, however, thinks that mistletoe was never *put up in churches*, among evergreens, "but by mistake or ignorance of the sextons; for it was the heathenish or profane plant, as having been of such distinction in the pagan rites of Druidism, and it therefore had its place assigned it in kitchens, where it was hung in great state with its white berries. . . . I learned at Bath that it never came into the church there. An old sexton at Teddington, in Middlesex, informed me that some mistletoe was once put up in the church there, but was by the clergyman immediately ordered to be taken away."

Sir Thomas Browne (*Vulgar Errors*, book ii. chap. 6) discourses of the virtues of mistletoe in "epileptical intentions. Country practice hath added another, to provoke the afterbirth, and in that case the decoction is given unto cows. That the berries are poison, as some conceive, we are so far from averring, that we have safely given them inwardly, and can confirm the experiment of Brassavolus, that they have some purgative quality."

Sir John Colbach, in his dissertation concerning mistletoe, 1720, strongly recommends it as a medicine for epilepsy and all other convulsive disorders: adding, that this beautiful plant must have been designed by the Almighty "for further and more noble purposes than barely to feed thrushes, or to be hung up superstitiously in houses to drive away evil spirits." He refers the veneration in which the Druids were held to the cures they performed by means of the mistletoe of the oak, "this tree being sacred to them, but none so that had not the mistletoe upon them." But Sir John endeavours to show the mistletoe of the crab, the lime, the pear, or any other tree, to be of equal virtue. The seeds of mistletoe ripen late, between February and April. If the ripe berries are rubbed upon the branches of trees, between February and April, they may be readily cultivated; and mistletoe has thus been found to germinate on the oak, several of the pine tribe, cherry, common laurel, Portugal laurel, holly, lime, elm, hornbeam, birch, sycamore, ash, chestnut, hazel, and acacia, as well as the apple, pear, and white-thorn tribe; but on all except the apple and pear, the seeds soon sicken and die.

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Laws and Customs.

ANTIQUITY OF JUDGES' CIRCUITS.

This is confirmed in the 1st of Samuel, c. vii. v. 16: "And he (Samuel) went from year to year in circuit to Bethel and Gilgal and Mizpeh, and judged Israel in all those places." The system of Judges going circuit was instituted in England by King Henry II. This monarch divided the kingdom into six circuits, and commissioned his newly-created Justices in eyre, *in itinere*, to administer justice and try writs of assize in the several counties.

CURSITOR-BARON OF THE EXCHEQUER.

The title of Baron-Cursitor was evidently adopted in imitation of the ancient Cursitors in Chancery, who, holding the second place under the chief clerks or masters of that court, were called in Latin *Clerici de cursu*, and prepared all original writs and other writs *of course*. So also the Baron-Cursitor held a secondary rank to the Barons or Judges, and was solely employed, like the Chancery Cursitors, in executing the formal business, and the settled rules of the Exchequer. One of the most showy functions of the Cursitor-Baron is to make the public announcement of the Crown's approval of the election of the Sheriffs of London and Middlesex: a duty perhaps imposed upon him because the time of their inauguration (Sept. 29) occurs in the middle of the vacation, when the other Barons are absent. —*E. Foss, F.S.A.; Archæologia*, vol. lvi. pp. 29, 31.

ORIGIN OF SOLICITORS.

This branch of legal practitioners seems to have arisen in great part out of the suits in the Star-Chamber. "In our age," says Hudson, a barrister of Gray's Inn in the reign of Charles I., "here are stepped up a new sort of people called Solicitors, unknown to the records of the law, who, like the grasshoppers in Egypt, devour the whole land; and these, I dare say (being authorised by the opinion of the most reverend and learned Lord Chancellor that ever was before him), were express maintainers, and could not justify their maintenance upon any action brought; I mean not where a lord or gentleman employed a servant to solicit his cause,—for he may justify his doing thereof; but I mean those which are common solicitors of causes, and set up a new profession, not being

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allowed in any court, or at least not in the court where they follow causes; and these are the retainers of causes, and devourers of men's estates by contention, and prolonging suits to make them without end."—*John Bruce, F.S.A., on the Star-Chamber; Archæologia*, vol. xxv. pp. 343-393.

The erroneous impression that the name of "Solicitor" is a more honourable designation than that of "Attorney" has been thus corrected by Mr. Samuel Warren, in his *Lectures*. The late Lord Tenterden took some trouble several times in refuting such a notion, and stigmatised as absurd the conduct of those who called by the name of *solicitors* persons conducting proceedings in courts of *law*. The proper expressions are "Attorney-at-law" and "Solicitor-in-equity." There is no difference whatever between the two in respect of rank or *status*, —any more than there is between barristers practising respectively in courts of law, and equity. If there be any preference, I should have thought it would lean to the good old Saxon word *attorney*—indicating an office most honourable and ancient. The word "solicitor" is, comparatively speaking, of much more recent introduction—an off-shoot from the under-clerks of the now abolished Six Clerks in the Court of Chancery.* . . . . . At all events, never use the word "solicitor" either in writing, or verbally, with reference to proceedings *at law*; or you will justly incur the censure expressed by Lord Tenterden.

These observations are not applicable to Scotland, where there is no such class of practitioners as attorneys. There "lawyer" or "solicitor" answers to our "attorney-at-law." The office of "attorney" in Scotland is merely private, and conferred by letter of attorney, regulating the nature and extent of the business therein delegated.

Attorneys are said to be "Gentlemen by Act of Parliament." Why so is, however, not clear; for among the various acts relative to attorneys no such enactment is to be found. The idea may possibly have arisen from the term "general attorney," or *attornatum genālem*, as expressed in a very early statute, that of Westminster 2, the 13th Edward I., st. i. c. 10, the words having possibly been converted into "Gentleman Attorney." However, the term thus applied to attorneys is no less invidious than dubious. Of itself, their profession, when honestly and rightly exercised, is clearly that of a gentleman without any peculiar distinction.

SERGEANT-AT-LAW; HIS COIF AND RINGS.

Sergeant-at-Law, in Latin *Serviens ad legem*, is the highest degree of the Common Law, and is equivalent to that of Doctor in the Civil Law. The Sergeantcy-at-Law, moreover, is

* A.D. 1842, by stat. 5 and 6 Vict. c. 103, s. 1. In the early history of the Court of Chancery, the Six Clerks and their under-clerks appear to have acted as the attorneys of the suitors. As business increased, these under-clerks became a distinct body, and were recognised by the court under the denomination of "sworn clerks," or "clerks in court." The advance of commerce, with its consequent accession of wealth, so multiplied the subjects requiring the judgment of a Court of Equity, that the limits of a public office were found wholly inadequate to supply a sufficient number of officers to conduct the business of the suitors. Hence originated the "Solicitors" of the Court of Chancery.—(See *Smith's Chancery Practice*, p. 62, 3d edit.)

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somewhat of a title or dignity as well as a degree, being created by the Queen's writ, and the Sergeant's coif is said to be *signum status et gradus*. In his armorial ensigns the Sergeant bears a helmet open and front face like that of a knight, and not with the visor down as an esquire's is. The Sergeants-at-Law form a brotherhood to which the Judges of the Common-Law Courts at Westminster must belong. So strict is the rule, that if a lawyer be raised to the bench of those courts, and be not then a sergeant, he is forthwith made one prior to being constituted a judge. For this reason, as belonging to the same body, the Judges of the Common-Law Courts at Westminster invariably address a sergeant as "Brother;" and they never apply the term to any other counsel. The Sergeants are a body incorporated by Act of Parliament, and not an Inn of Court. The dress of the Sergeant (his robes varying in colour on particular days) has much of an ecclesiastical character, no doubt from this fact: the original Sergeants-at-Law were certain obstinate clerical lawyers, who, tempted, doubtless, by the fees, would persist in remaining as advocates in the secular courts after they were prohibited by canon. To hide the tonsure, which did not suit their renegade position, they covered it with a piece of linen called "the Coif;" hence the term which designates their degree. The modern Sergeant, however, leaves the place of tonsure visible by means of a circular black patch on the top of his wig. By that mark, peculiar to his order, the Sergeant-at-Law may always be recognised in court.

The *process* of giving a Sergeant's ring is this: After the writ is issued from the Petit Bag Office, calling upon him to take upon himself the degree of the coif under the penalty of 1000*l.*, he receives a notice from the Lord Chancellor to appear before him and be sworn in. At the time and place appointed he does appear, attended by a barrister, commonly called his *colt*. He takes the oaths of allegiance, supremacy, &c. This over, the colt advances and "begs to present to the Lord Chancellor a gold ring for her Majesty." He also begs to be allowed to present another to the Lord Chancellor. Both are graciously accepted. Her Majesty's is worth 10*l.* The make of these rings is very antique, and they bear an appropriate motto chosen by the Sergeant. The *meaning* of this ring-giving is a mystery—is lost in antiquity. It seems to have a close connection with *knighthood*, as the Sergeants all wear on their shields the open helmet. But how the Crown came to *receive* instead of *give*, on the investiture, this gold symbol, is nowhere satisfactorily shown. An opinion seems to prevail, that, in consequence of the poverty of the Crown at some time or another, the Sergeants offered to defray (amongst other things) the cost of this ring; and then, for the transition is easy, came to give the ring itself. But this is mere conjecture.

SPECIAL PLEADERS.

The word "Pleading" at the English bar does not mean the speaking of an advocate, but technically designates the

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drawing out of such written statements and counterstatements in a cause as are necessary to show what is the actual question in dispute that is to form the subject of the trial. An English lawyer will seldom or never use the word pleading in any other sense. So far from pleading referring to speaking, there is a certain class of very learned professional gentlemen who have no audience in a public court of justice. These are the "Special Pleaders," who have not been called to the bar, but who, after keeping the full terms necessary for being so called, and on paying a certain amount of stamp-duty, are permitted to practise in the way of "pleading," that is, in making the statements and counterstatements above mentioned, as well as advising on the evidence necessary to sustain a case, and drawing out affidavits and many other legal writings requiring to be done with great knowledge and care. A special pleader of this description must, of course, to succeed, be a person profoundly versed in the learning of the law, and quite a master of his art. He usually takes pupils, who attain their preparation for the bar from aiding him in the drawing and study connected with the subjects that come before him. After some years of this practice, a special pleader goes himself to the bar, and generally reaches the bench; for most of the puisne judges have been "special pleaders." It should, however, be understood, that an actual barrister may, and often does, practise as a "special pleader;" but his absence in court and on circuit rather interferes with the continual application that "pleading" requires. From the recent reform and greater facility of legal process, the class of special pleaders not at the bar is now far less numerous than it used to be. The establishment of the body of Special Pleaders dates from about the beginning of the last century. Before then, students for the Bar went as pupils to solicitors.

NISI PRIUS.

This term, generally, though not with legal strictness, is applied to all actions in the superior courts of a civil nature: the word "Nisi Prius" Court at the assizes is understood to designate that court where the civil actions are tried. A trial at Nisi Prius really means the trial of a cause which has arisen in one of the superior courts of Westminster, and which has been sent for a decision on the facts before a jury and one of the judges (or now a judge alone) of such courts, to be heard elsewhere than in the full sitting or sitting at bar, as it is called, of the court. The superior court meanwhile reserves to itself the judgment and ulterior proceedings. The word "Nisi Prius" arose from an expression in the old writ of Venire Facias, which directed the sheriff of the county where the action arose to summon jurors to come on a day named from such county to

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Westminster to try the action there, "Nisi Prius" (so said the Latin writ) "*unless before* that day" the judges of assize came into his (the sheriff's) county, and then he was to summon the jurors before such judges of assize. Now these judges were sure to come into the county to hold the assizes before the day named, and thus were the litigants and their jurors relieved from the trouble and expense of going to Westminster to have the actual matters of fact tried there. The Jury summons has been altered, but the name of Nisi Prius continues to designate the same kind of trial to this day. The action, and the law and judgment upon it, remain still with the courts at Westminster; while, for convenience, the trial of the facts is deputed elsewhere, viz. to what has become a fixed, understood term, "Nisi Prius." Criminal proceedings have mostly their origin, trial, and judgment in the county where the offence or arrest occurs; but sometimes when the indictment is found in the Court of Queen's Bench, it is sent for trial to the assizes, and it is then said to be tried at Nisi Prius. After trial, the offender, if convicted, is brought to Westminster to be sentenced.

JUSTICES IN EYRE, OR OF ASSIZE.

In the early ages of our jurisprudence, as an intolerable burden would have been thrown upon suitors if they had been required in every case to come up to the place where the king's court held its sittings to procure justice, the remedy was devised of sending into different parts of the country persons commissioned to try sometimes all, sometimes certain, classes of the cases arising in those parts and then ready for hearing. These were known as *Justices in Eyre* (*i. e.* itinere), or, as they were called, from one of the most important classes of cases which they were usually commissioned to try, those relating to the possession of land, Judges of Assize,—assize being the name of the jury whom, by the writ commencing this species of trial, the sheriff was ordered to summon, for the purpose of ascertaining by their verdict the person *primâ facie* entitled to be tenant of the soil.—(*Feasts and Fasts*, by E. V. Neale, 1845.) Justices in Eyre are mentioned as early as 1170; but the division of the kingdom into six districts or circuits (a little different, but not much, from the present), and the appointment of three justices to each, dates from 22 Henry II., or 1176. To these Justices in Eyre have succeeded our modern Justices of Assize. Wales also at present forms two additional circuits, which proceed to and unite themselves into one at Chester.

THE HISTORICAL AND LEGAL YEARS.

Remarkable examples of the confusion produced by two modes of computing dates are afforded by two of the most celebrated events in English history. King Charles I. is said

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by most authorities to have been beheaded on the 30th of January 1648; whilst others, with equal correctness, assign that event to the 30th of January 1649. The Revolution which drove James II. from the throne is stated by some writers to have taken place in February 1688; whilst according to others, it happened in February 1689. These discrepancies arise from some historians using the *Civil and Legal*, and others the *Historical Year*; though both would have assigned any circumstance after the 25th of March to the same years, namely 1649 and 1689.

To avoid, as far as possible, the mistakes which this custom produced, it was usual to add the date of the *Historical* to that of the *Legal Year*, when speaking of any day between the 1st of January and the 25th of March; thus:

Jan. 30, $164\frac{8}{9}$ { *i.e.* 1648, the civil and legal year. / *i.e.* 1649, the historical year.

or thus:

January 30, 1648-9.

This practice, common as it has long been, is nevertheless frequently misunderstood; and even intelligent persons are sometimes perplexed by dates being so written. The explanation is, however, perfectly simple; for the *lower* or *last figure* always indicates the year according to our present calculation.—*Sir Harris Nicolas.*

ESSOIGN-DAYS, AND DAYS OF GRACE.

In the reign of Henry II., the day first mentioned in each term was called Essoign-day, because the court then took the essoigns, or excuses, of those who did not appear according to the summons of the writs; but as—by a custom, traced by Blackstone to the Germans of the age of Tacitus (*Com.* iii. 278)—three days of grace were allowed to every defendant within which to appear, the court did not sit for the despatch of business until the fourth day after that time. On the other hand, they continued to sit till the fourth day *after* the last return. Thus, *e.g.* Hilary Term was not considered to begin till the 23d of January, nor to end till the 12th of February.

ATTAINMENT OF MAJORITY—"COMING OF AGE."

Professor de Morgan, in the *Companion to the Almanac*, 1850, says:

"A person who is born on the 10th of June, in our day, counts a year as completed so often as a 10th of June arrives. He says, 'I shall not be of age until the 10th of June;' ask him how old he is on the 9th, and he will say, 'I shall not be of age till to-morrow.' If he were born at noon, it is true that he does not complete twenty-one years of days divisible into fractions until the noon of the 10th. Nevertheless, in the

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law, which here preserves the old reckoning, he is of full age on the *ninth;* though he were born a minute before midnight on the 10th, he is of age to execute a settlement at a minute after midnight on the morning of the 9th, forty-eight hours all but two minutes before he has drawn breath for the space of twenty-one years. The law reasons thus: —there are no parts of days; he who is born on the 10th, takes the whole of the 10th as part of his life; he is a year old when he has completed 365 days; the 9th of next year is his 365th day; as soon as he has commenced the 9th, he has passed through the whole of it, for the day has no parts; therefore he has lived a complete year, or is one year old as soon as the 9th arrives. And the conclusion is unavoidable so soon as it is granted that a day has no parts. The anniversary of the birth used to be celebrated as the first day of a new year; it is now considered as the completion of the old one."

We have the following good authority for Professor de Morgan's statement:

"The full age in male or female is twenty-one years, which age is completed on the day preceding the anniversary of a person's birth, who till that time is an infant, and so styled in law."—*Blackstone's Commentaries*, vol. i. p. 463.

That the law rejects fractions of a day is clear. In the case of Reg. *v.* the Parish of St. Mary, Warwick, reported in the *Jurist* (vol. xvii. p. 551), Lord Campbell said:

"In some cases the court does not regard the fraction of a day. Where the question is, on what day a person came of age, the fraction of the day on which he was born, and on which he came of age, is not considered. . . . It is a general maxim, that the law does not regard the fraction of a day."

THE LAWYER'S DAY.

In a black-letter octavo, entitled *A Concordancie of Yeares*, 1615, by Arthur Hopton, we find the following:

"The day is of two sorts, natural and artificiall: the natural day is the space of twenty-four hours, in which time the sunne is carried, by the first Mover, from the east into the west, and so round about the world into the east againe.

"The artificiall day continues from sunne-rising to sunne-setting: and the artificiall night is from the sunne's setting to his rising. And you must note that this natural day, according to divers, hath divers beginnings: as the Romanes count it from midnight to midnight, because at that time our Lorde was borne, being Sunday; and so do we account it for fasting dayes. The Arabians begin their day at noone, and end at noone the next day; for because they say the sunne was made in the meridian; and so do astronomers count the day, because it always falleth at one certaine time. The Umbrians, the Tuscans, the Jewes, the Athenians, Italians, and Egyptians do begin their day at sunne-set, and so do we celebrate festivall dayes. The Babylonians, Persians, and Bohemians begin their day at sunne-rising, holding till sunne-setting; *and so do our lawyers count it in England.*"

Upon this, a correspondent of *Notes and Queries*, No. 207, is of opinion, that Hopton's statement that lawyers count their

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day from sunrise to sunset, merely refers to certain instances, such as distress for rent.

"A man cannot distrain for rent or rent-charge in the night,—which, according to the author of *The Mirror*, is after sunset and before sunrising."—*Impey, on Distress and Replevin*, p. 49.

In common law the day is now supposed, among lawyers, to be from six in the morning to seven at night for services of notices: in Chancery till eight at night. And a service after such times at night would be counted as good only for the next day. In the case of *Liffin* v. *Pitcher*, 1 *Dowl. N.S.*, 767, Justice Coleridge said: "I am in the habit of giving twenty-four hours to plead when I give one day." In short, the lawyers, from Coke down to our time, give both days, the natural and artificial, as legal days.

CATCHPOLLS AND BAILIFFS.

A Catchpoll was formerly a common name for a bumbailiff. The "*catchpollis*" described in Wiclif's New Testament (*Dedis of Apostles*, c. xvi.) were sergeants under the magistrates; but are thus described in the glossary: "*Cacchepoles*, bailiffes, lictors, from *catch* and *pole*, because these officers, in executing their office, lay hold of the man's neck." A few years since, two of the instruments formerly used for this purpose were found among a heap of old iron from Aylsham Bridewell, in Norfolk, which bears the date of 1543. The instrument has a long wooden handle, and has two iron springs affixed to a circular part, which received the arm or lower part of the leg of a thief. Another iron was affixed to a long pole, to draw a thief in a retrograde motion out of a hole when attempting to make his escape. But the usual way was to *catch* the thief with this instrument by the *poll*. Such irons appear to be still used by the Swedish and Danish watchmen; for the watchmen of Stockholm and Copenhagen are described as perambulating the town at night with a curious weapon like a pitchfork, each side of the fork having a spring barb, used in securing a running thief by the leg. The employment of it requires some skill and practice, and constitutes no inconsiderable part of the art and mystery of thief-catching.—*J. A. Repton, F.S.A.; Archæologia*, vol. xxii.

GALWAY JURIES.

It is a fact not very generally known beyond the precincts of our courts of law, that the Galway juries have a character for intelligence and integrity beyond that of any other juries in Ireland. Whenever there is a weighty, difficult, or complicated case to be tried, it is always desired, by the party to whom a just decision is an object, to bring it before *a Galway jury*.—*Dublin University Magazine*, 1840.

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WHAT IS A COUSIN?

In a case in Chancery where a testator had left his property to *his cousins*, the Vice-Chancellor (Stuart) held that this included first cousins once removed, as also second cousins. The Lord Chancellor (26th Nov. 1855) reversed this decision, and held that first cousins were alone entitled to the benefit of the will. The counsel for the more extended meaning of the word cited the following authorities:

"This kyng was enticed so, that he now atte laste
Ys est and up hys *cosyn* bigan too werre faste."
R. Gloucester, p. 38.

"Oon of the bisschopis servauntis, *cosyn* of him whoose eare Petir kitle of, soide, Sigh I thee not in the gherd with him?"—*Wiclif*, John c. 18.

"For I myself desiride to be departed fro Christ for my britheren that ben my *cosyns* after the fleisch, that ben men of Israel."—*Id.* Romaynes c. 9.

"Ede Plato sayeth, who so can him rede
The wordes, most ben *cosin* to the dede.'
Chaucer, Prologue, v. 719.

"And for as muckel as this goode man
And eke this monk, of which that I began,
Were both two yborne in a village,
The monk him claimeth as for *cosinage*."
Id. Shipmanne's Tale, v. 12.

The word "cousin" occurs about two hundred times in Shakspeare, and generally in a sense different from that of first cousin.

THE STAR-CHAMBER.

The origin of the name "Star-Chamber" has been much disputed; but the most satisfactory explanation appears to be that given by Mr. Caley, in the *Archæologia*, vol. viii. p. 404, namely, from the ceiling of the chamber being anciently ornamented with gilded stars.* The occupation of the "Chambre des Estoyers" or "Estoilles," by the king's council, in the palace at Westminster, can be traced to the reign of Edward III.; but no specific mention of the Star-Chamber *as a court of justice* can be found, Mr. Bruce believes, earlier than the reign of Henry VII., about which time the old titles of "the Lords sitting in the Star-Chamber," and "the Council in the Star-Chamber," seem to have merged in this one distinguishing appellation.† After the sittings, the lords dined in the inner Star-Chamber at the public expense. The mode of the proceedings before the council was twofold: one, *ore tenus*, or by

* Barrington refers it to Stor, or Storrum, a Jewish term in ancient contracts.

† The judges, before and subsequent to this alteration, were the same, viz. the members of the king's ordinary council,—"the Lords of the Council," as they are still termed in the Litany of the Church service, although many of them have generally been under the degree of a Baron.

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the mouth; the other, by bill and answer. The proceeding *ore tenus*, usually adopted in political cases, originated in "soden reporte," which Mr. Bruce thinks means private and probably secret information given to the council. The person accused or suspected was immediately apprehended, and privately examined. If he confessed any offence, or if the cunning of his examiners drew from him, or his own simplicity let fall, any expressions which suited their purpose, he was at once brought to the bar, his confession or examination was read, he was convicted *ex ore suo* (out of his own mouth), and judgment was immediately pronounced against him. Imagination can scarcely picture a more terrible judicature. This tribunal was bound by no law, but created and defined the offences it punished; the judges were in point of fact the prosecutors; and every mixture of those two characters is inconsistent with impartial justice. Crimes of the greatest magnitude were treated of in this court; but solely punished as trespasses, the council not having dared to usurp the power of inflicting death. Among the many abuses of the process was, that in the time of Queen Elizabeth, "many solicitors who lived in Wales, Cornwall, or the farthest parts of the North, did make a trade to sue forth a multitude of subpœnas to vex their neighbours, who, rather than they would travel to London, would give them any composition, though there were no colour of complaint against them." The process might anciently be served in any place: in Roman Catholic times it was usually served in the market or church. The highest number of the council who attended the court in the reigns of Henry VII. and VIII. was nearly forty, of whom seven or eight were prelates; in the reign of Elizabeth the number was nearly thirty, but it subsequently declined. The Chancellor was the supreme judge, and alone sat with his head uncovered. Upon important occasions, persons who wished "to get convenient places and standing" went there by three o'clock in the morning. The counsel were confined to a "laconical brevity;" the examinations of the witnesses were read, and the members of the court delivered their opinions in order from the inferior upwards, the Archbishop preceding the Chancellor. Every punishment, except death, was assumed to be within the power of the Star-Chamber Court. Pillory. fine and imprisonment, and whipping, wearing of papers through Westminster Hall, and letters "seared in the face with hote irons," were ordinary punishments.

Henry VII. had a fondness for sitting in the Star-Chamber: the court was the great instrument for his "extort doynge;" and "the king took the matter into his own hands," was a Star-Chamber phrase; and "my attorney must speak to you," was a sure prelude to a heavy fine. Wolsey made a great show

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of his magnificence in the Star-Chamber: he proceeded to the sittings of the court in great state, his mace and seal being carried before him; "he spared neither high nor low, but judged every estate according to their merits and deserts." After his fall, with the exception of occasional interference in religious matters and matters of police, we seldom hear of the Star-Chamber. (See the very able dissertation by John Bruce, F.S.A., *Archæologia*, vol. viii. pp. 342-392.)

The Star-Chamber held its sittings, from the end of Queen Elizabeth's reign until the final abolition of the court by Parliament in 1641, in apartments on the eastern side of New Palace Yard; these buildings bore the date 1602, and E. R. and an open rose on a star; they corresponded with the "Starre-Chamber" in Aggas's plan of London in 1570. The last of the buildings was taken down in 1836; drawings were then made of the court, which had an enriched ceiling, but no remains of the *star* ornamentations, notwithstanding, behind the Elizabethan paneling, the style of the chamber was Tudor-Gothic. The remains are preserved at Leasowe Castle, the seat of the Hon. Sir Edward Cust, in Shropshire.

"HE WHO IS HIS OWN COUNSEL HAS A FOOL FOR HIS CLIENT," is an old and homely saying, embodying the results of long and nearly uniform experience. In our courts, persons engaged in litigation may appear and conduct their own causes personally, if they choose; but, as Chancellor Kent of America justly observes, this is a right (he calls it a privilege conceded) which, though in itself reasonable, is, upon the whole, useless; for the necessity of a distinct profession, to render the application of the law to every particular case easy and certain, has always been felt in every country under the government of written law. As property becomes secure, and the arts are cultivated and commerce flourishes, and when wealth and luxury are introduced, and create the innumerable and apparently indefinite distinctions and refinements of civilised life, the law necessarily and gradually assumes the aspect, and acquires the character, of a complicated science, requiring in its application the skill and learning of a particular profession. This is a truth so self-evident, as to be acquiesced in by all sane persons, except in the few cases where overweening and conceited confidence in their own powers has occasionally led individuals to contribute, by their sad experience, evidence in support of the truth of the ugly-sounding proverb just quoted; which really signifies, first, that when a man's own interests are at stake, his natural eagerness and anxiety are alone sufficient to disable him from efficient action, and operate as disturbing forces upon his interests; secondly, that besides this, he presumptuously

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essays the use of weapons with which he is not acquainted, and that too against those who are.

"DEATH-WARRANTS."*

An opinion is commonly entertained that the sovereign signs some instrument by virtue of which capital offences are punished with death; hence these presumed documents are popularly termed "Death-Warrants." Such, however, not only is not, but, as far as our knowledge goes, never in this country has been the case.

The only authority for the execution of a criminal is the verbal sentence of the judge, pronounced in open court, in a prescribed form of words. This the Sheriff, or his deputy, is bound to hear and to execute.—(See Atkinson's *Sheriff Law*, 3d edit.)

After the offenders are tried, the judge (or at the Old Bailey, the Recorder) signs a list, containing the names, offences, and punishments of the convicts, and the names of the prisoners acquitted; and a copy of this list is given to the Sheriff. This list (commonly called a Calendar) is, however, a mere memorandum, and of no binding authority whatever. Lord Hale, in the second volume of his *Pleas of the Crown*, records the case of a judge *refusing* to sign any calendar, fearing, he said, it might *grow* into a rule; the sheriff, believing that the calendar was really necessary, neglected to execute a criminal who had been capitally convicted, and he was very heavily fined in consequence; the law being distinctly laid down by Lord Hale, and the other judges of the time, that the *verbal* sentence was "the only and sufficient authority."

So important, indeed, does the law deem this verbal sentence of death to be, that it is very reluctant to use it in cases where probably it will not be carried into effect; and in such cases the judge is empowered by act of parliament to abstain from *passing* sentence of death, and to order such sentence to be *recorded* only.

At the Old Bailey the custom *formerly* was for the Recorder, at the termination of each session, to wait upon the sovereign with a list of all the prisoners lying under sentence of death; and, after explaining the several cases, to receive the royal pleasure thereon, and then, by a warrant under his (the Recorder's) hand, directed to the sheriffs, to command execution to be done on a day and at a place therein named. This practice continued until the accession of her present Majesty, in the first year of whose reign Mr. Baron Parke (now Lord Wensleydale) tried a man at the Old Bailey for a certain offence still by the letter of the law capital. From motives of delicacy it

* Obligingly communicated by an accredited Correspondent.

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was deemed highly inexpedient to lay the details of the crime before the Queen; and, in order to prevent an infringement of the law by neglecting so to do, a Bill was hurried through Parliament, the 1st Victoria, cap. 77, by the first section of which it was enacted that for the future it should not "be necessary that any report should be made to her Majesty her heirs and successors in the case of any prisoner convicted before the Central Criminal Court, and now, or who may hereafter be under sentence of death." Thus the practice at the Old Bailey is now assimilated to that of all the other courts in the kingdom, and the sovereign is never consulted about any capital offences whatever.

"HANGMAN'S WAGES."

The sum of thirteenpence-halfpenny has no reference to the payment to the hangman, as is shown in the notes to Butler's *Hudibras:*

"I cannot really say whence that sum (thirteenpence-halfpenny) was called 'Hangman's Wages,' unless in allusion to the *Halifax Law*, or the customary Law of the Forest of Hardwick, by which every felon, taken within the liberty or precincts of the said forest with goods stolen to the value of thirteenpence-halfpenny, should, after three market-days in the town of Halifax after his apprehension and condemnation, be taken to a gibbet there, and have his head cut off from his body."

The following document tends to rectify this old error, that it costs only thirteenpence-halfpenny to be hung. It is copied verbatim from a bill made out by the executioner, when Sir John Silvester was Recorder of London:

SILVESTER.	*s.*	*d.*
Executioner's fees	7	6
Stripping the body	4	6
Use of shell	2	6
1813. Nov. 10.	14	6

THE GARROTE

(Spanish) is a barbarous mode of execution, thus described in a Jamaica journal, detailing the execution of General Lopez at Havannah, Sept. 1, 1851:

The prisoner is made to sit in a kind of chair with a high back, to which his head is fastened by means of an iron clasp, which encloses his neck, and is attached to the back by a screw. When the signal is given, the screw is turned several times, which strangles the victim, and breaks his neck.

THE DEODAND.

By Deodand (*Deo dandum*, given to God) is understood whatever personal chattel occasions the death of a man without the default of another, and also the instrument with which the murder is committed. In England deodands (now abolished by statute) were forfeited to the king, to be applied to pious

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uses and distributed in alms by his high almoner; but the Crown most frequently granted the right to deodands, within certain limits, to individuals for an estate of inheritance to be annexed to lands, in virtue of which grants they were claimed. The custom was also part of the Mosaic law (Exodus xxi. 28). It is thus mentioned by Bracton, one of the earliest writers on English law, who lived in the reign of Henry III.: "Omnia quæ movent ad mortem sunt deodanda," which is Englished in the *Termes de la Ley:*

> "What moves to death, or kill'd the dead,
> Is deodand and forfeited."

In modern times, juries have mitigated the forfeitures, and a given amount is commonly awarded as a deodand less than the value of the chattel.

Johnson defines this term from Cowel as follows:

Deo dandum (Lat.). A thing given or forfeited to God for the pacifying his wrath, in case of any misfortune, by which any Christian comes to a violent end, without the fault of any reasonable creature; as if a horse should strike his keeper, and so kill him; if a man in driving a cart, and endeavouring to rectify something about it, should fall, so as the cart-wheels, by running over him, should press him to death; if one should be felling a tree, and giving warning to company by, when the tree was near falling, to look to themselves, and nevertheless any of them should be slain by the fall of the tree: in these cases, the horse, the cart-wheels, cart and horses, and the tree, are to be given to God, that is, sold and distributed to the poor, for an expiation of this dreadful event, though occasioned by unreasonable, senseless, and dead creatures: and though this be given to God, yet is it forfeited to the king by law, as executor in this case, to see the price of these distributed to the poor.

Blackstone refers it to the humane superstition of our ancestors; the forfeited chattel being intended, as were also the garments of a stranger found dead, to purchase masses for the soul of him who had been snatched from the world by sudden death. Deodands were abolished by the 9 and 10 Vic. c. 62.

TREASURE-TROVE.

Comparatively few persons have probably ever had occasion to inquire, or in any way to learn the law affecting treasure found under ground; and as such facts—technically known as "Treasure-trove"—are frequently occurring in all manner of places, it may be useful to know some of the main points of the law affecting them. In the first place, to entitle either the Crown, or the subject to whom the regal right has been conceded, to treasure-trove, it must be clearly shown that the article found consists either in 'money or coin, gold, silver, plate, or bullion;' and it must be shown (to the satisfaction of a jury, if need be), that it had been hidden *in* the earth, or other private place (we quote Blackstone), and that he who hid

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it is unknown. So that it is a condition precedent to any right to treasure-trove, that the matter found must be literally and intrinsically of the nature of *treasure;* and that it must have been *hidden*, not *lost* (as so much treasure must have been from the persons of the unfortunate, whether by the casualties of travel or the fortune of war)—not *buried*, as so much has notoriously been, in silent yet frequently most conspicuous tombs—not *sunk* in the sea or *scattered* on its beach—not *lying* on the *surface* of the ground in any quarter whatever. The treasure, to be claimable treasure-trove, must have been designedly hidden—not intentionally abandoned—to entitle either the king or his feudatory to claim it.

The concealment of treasure-trove is a species of criminal neglect, which constitutes a misprision punishable by fine and imprisonment. As a familiar instance, the detention of articles "found" in an omnibus is an offence punishable by the Metropolitan Police Act.

"MEN OF STRAW."

Many years ago, men could easily be found to give any evidence, upon oath, that might be required: and some of these persons walked openly in Westminster Hall with a straw in one of their shoes, to signify they wanted employment as witnesses; hence originated the saying, "he is a Man of Straw." But the custom has high antiquity. A writer in the *Quarterly Review* (vol. xxxiii. p. 344), on Greek Courts, says: "We have all heard of a race of men who used in former days to ply about our own courts of law, and who, from their manner of making known their occupation, were recognised by the name of *straw-shoes*. An advocate or lawyer who wanted a *convenient* witness, knew by these signs where to find one, and the colloquy between the parties was brief. 'Don't you remember?' said the advocate—(the party looked at the fee and gave no sign; but the fee increased, and the powers of memory increased with it)—'To be sure I do.' 'Then come into court and swear it!' And straw-shoes went into court and swore it. Athens abounded in straw-shoes."

BUTCHERS NOT JURYMEN.

"As the law does think it fit
No butchers shall on juries sit."
Butler's Ghost, canto ii.

The vulgar error expressed in these lines is not extinct even at the present day. Barrington, in his *Observations on the more Ancient Statutes*, p. 474, on 3 Hen. VIII., after referring in the text to a statute by which surgeons were exempted from attendance on juries, adds, in a note: "It may perhaps be thought

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singular to suppose that this exemption from serving on juries is the foundation of the vulgar error, that a surgeon or butcher, from the barbarity of their business, may be challenged as jurors." But Sir H. Spelman says: "In our law, those that were exercised in slaughter of beasts were not received to be triers of the life of a man" (*Posth. Works*, p. 112; *St. Trials*, vol. ii. p. 1171). So learned a man as Spelman must surely have had some ground for this statement.—(*Notes and Queries*, No. 82.) Butchers are not now exempt; but surgeons, and physicians, and apothecaries, are, not from the barbarity, but obviously from the necessary exercise at all hours of their occupation.

WINDOW-LIGHT CUSTOM.

In the London Corporation Inquiry, made in 1834, Mr. Woodthorpe, the town-clerk, mentioned the following ancient custom in the City, with respect to the taking away of a light or window. If a man had a window in his house looking into an open space in which there had never been any building in his memory, and that another erected a wall which obstructed the light from that window, the person so erecting it would be justified, if he could show that a building had at any time within the memory of man stood there. All that the party erecting had to do was, to get the Recorder to appear in the Court of King's Bench, and (on proof of the fact of the previous building) to plead "the custom of the city of London," and the right of the party erecting the building would be admitted; or, in other words, the action of the party opposing the obstruction would be barred.

MILK AND MACKEREL SOLD ON SUNDAYS.

The sale of these articles on Sundays is legalised by Parliament. By a statute of the 13th of Car. II., carrying further than had been done under any of our sovereigns since the days of the Heptarchy the prohibition of labour or business upon the Lord's day, exception is made "for the crying or selling of milk before nine of the clock in the morning, or after four of the clock in the afternoon." And by a law of 10 Will. III., mackerel are permitted to be sold on Sundays before or after divine service; a provision afterwards recognised by the 2d of Geo. III. also in favour of fish-carts travelling on Sundays.

GAMING-TABLES AT RACES.

Nearly all the Gaming-tables taken to races are either false in themselves, or are played upon with false balls. Many years ago a large case, after remaining unclaimed at the coach-office of the White Horse Inn, Fetter-lane, was opened to discover its contents, which were found to be the frames of six E O

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tables, all of which were unfair ones. They were rendered so by a very simple construction. It merely consisted in the formation of the brass rods which divide the letters E and O. They all project *a little* beyond the surface of the circular frame round which the ball revolves; but by the two which immediately precede the barred E and the barred O being a little longer than the rest, the ball, when its rotatory action becomes weak, is imperceptibly arrested by it in its course, and thus falls into the barred letter, which wins.—*Nimrod.*

THE "ROUND-ROBIN."

This is a circle, divided from the centre, like the famed Arthur's Round Table, whence it is thought to have originated. In each compartment of the "Robin" is a signature; so that the entire circle, when filled, exhibits a list, without priority being given to either name.

It is, however, stated that the Round-Robin, without which British sailors would be deprived of their right of petition, was first invented in Athens, on the occasion of the conspiracy of Aristogeiton and Harmodius against the tyranny of the Pisistratidæ. The Romans, in imitation of the Greeks, not to indicate their preference to any either among their guests, or friends, or slaves, wrote their names in a circle, in such a manner that it was impossible to say which was first, second, or last, in their estimation.

THE "BROAD-ARROW,"

used as a Government mark, is thought to have had a Celtic origin; and the so-called arrow may be the /\ or *d*, the broad *a* of the Druids. This letter was typical of superiority either in rank and authority, intellect or holiness; and is believed to have stood also for king or prince.—*Notes and Queries*, No. 108.

The same figure occurs on coins, gems, &c., as the symbol of Mithras; and the symbol of the Moon was used by the ancient Germans precisely as our broad-arrow, viz. on boundary-stones, &c. The like symbol occurs in our churches, as symbolical of the Sun of Righteousness, and in our painted windows and altar-cloths, &c.

THE IMPERIAL STANDARD MEASURE.

An act of parliament passed 18 and 19 Vict. cap. 72, repeals so much of the act of the 5th of George IV. cap. 7, as relates to the restoration of the Imperial Standard yard and the Standard Pound Troy respectively, in cases of loss, destruction, defacement, or other injury. The restored standard yard is established, being the straight line or distance between the centres of the two gold plugs or pins in the bronze bar deposited in the office of the Exchequer. The weight of platinum marked "P. S., 1844, 1 lb.," deposited in the office of the Exchequer, is to be the legal and genuine standard measure of weight and the imperial standard pound avoirdupois.

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Church and State.—Parliament.

HIGH CHURCH AND LOW CHURCH.

THE distinction of *High Church* and *Low Church* always existed in the Reformed English Church; but the *names* were not coined till the close of the seventeenth century, and were not stamped in full relief as party names until the disputes in Convocation in 1702; and they were ever afterwards used to distinguish the clergy. Until the time of William of Orange, the Church of England *as a body*—her sovereigns and bishops, her clergy and laity—comes under the denomination of *High Church;* while those who sympathised with the Dissenters were few and weak: but William, as head of the church, opened the floodgates of Puritanism, and admitted into the church what had previously been more or less external to it, which element, thus made part and parcel of the Anglican Church, was denominated *Low Church*. William supplanted the bishops and clergy who refused to take the oaths of allegiance to him as king *de jure;* and by putting High-Church Whigs and Latitudinarians in their places made them the dominant party. Sir Walter Scott, in his *Life of Dryden*, observes that

"Towards the end of Charles II.'s reign, the *High-Churchmen* and the Catholics regarded themselves as on the same side in political questions, and not greatly divided in their temporal interests. Both were sufferers in the plot, both were enemies of the sectaries, both were adherents of the Stuarts."

In James II.'s reign, and at the time these party names originated, the Roman Catholics were in league with the Puritans or *Low*-Church party against the High Churchmen, which increased the acrimony of both parties. In those days religion was politics, and politics religion with most of the belligerents. But Swift chose one party for its politics, and the other for its religion.

"Swift carried into the ranks of the Whigs the opinions and scruples of a *High-Church* clergyman. . . . . Such a distinction between opinions in Church and State has not frequently existed; the *High-Churchmen* being usually *Tories*, and the *Low-Church* divines uniformly *Whigs*."—*Scott's Life*, edit. 1824.

Swift, in his quaint *Argument against abolishing Christianity*, 1708, speaks of "those factious distinctions of *High*

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and *Low Church*, of Whig and Tory, Presbyterian and Church of England." Scott says of the *Tale of a Tub:*

"The main purpose is to trace the gradual corruption of the Church of Rome, and to exalt the English Reformed Church at the expense both of the Roman Catholic and Presbyterian establishments. It was written with a view to the interests of the *High-Church* party."

We select and abridge the above from "Notes" by Jarltzberg, in *Notes and Queries*, who winds up with these definitions:

"Mr. Thelwall says that he told a pious old lady, who asked him the difference between *High Church* and *Low Church*, 'The High Church place the Church above Christ, the Low Church place Christ above the Church.' About a hundred years ago, that very same question was asked of the famous South: 'Why,' said he, 'the High Church are those who think highly of the Church, and lowly of themselves; the Low Church are those who think highly of themselves, and lowly of the Church.'"—*The Rev. H. Newland's Lectures on Tractarianism*, 1852, p. 68.

The most celebrated High Churchmen who lived in the last century were Dr. South, Dr. Samuel Johnson, Rev. Wm. Jones of Nayland, Bishop Horne, Bishop Wilson, and Bishop Horsley.

THE RUBRIC.

By this word is implied a rule or direction. It is derived from the Latin word *rubrica*, which signifies red earth, red ochre, &c.; and it is employed to designate the rules which are laid down in the Book of Common Prayer to direct the minister and people in the performance of Divine worship. These rules were formerly printed in red letters, to distinguish them from the prayers and other parts of the liturgy, which were printed in black letters.

LAW OF PEWS IN CHURCHES.

By the general law, and of common right (says Sir John Nicholl), all the Pews in a parish church are the property of the parish: they are for the use, in common, of the parishioners, who are all entitled to be seated, orderly and conveniently, so as best to provide for the accommodation of all. The distribution of seats rests with the churchwardens, as the officers, and is subject to the control of the ordinary. Neither the minister, nor the vestry, has any right to interfere with the churchwardens in seating and arranging the parishioners. The duty of the churchwardens is to look to the general accommodation of the parish. Although the parishioners can claim to be seated according to their rank and station, yet the churchwardens should not, in providing for this, overlook the claims of all the parishioners to be seated, if sittings can be afforded them.

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WHAT IS PANTHEISM?

The absurd and impious old notion that affects to believe that the universe itself constitutes God; that that awful word represents only the aggregate of every thing that exists—that whatever is, is God, a substance for ever the same, and every thing in existence only a necessary succession of its modes of being. There are certain so-called philosophers of the present day who seriously avow these notions; and in doing so, unavoidably remind us of some who, *professing themselves to be wise, became fools.—Samuel Warren, M.P., F.R.S., D.C.L.**

Spinosa was an early disciple of Pantheism: hence his followers were called Pantheists.

Spinozism was the form of Pantheism taught by Benedict Spinosa, a Jew of Amsterdam, who maintained that God is not only the maker, but also the original matter of the universe, so that creation was only a development of himself by the Deity.—*Murdoch.*

In Europe, Christianity is giving way beneath an invading Pantheism. In Germany, in France, even among educated men in England, whose education has not been carried on in the great schools of the Church, or on the avowed principles of the Church, Pantheism is an avowed creed. Among the dregs of our population, though under no classical name, the same spirit is working: Socialism is a vulgar Pantheism.—*Quarterly Review*, 1840.

JUDAISM AND PAGANISM.

"There is one primary and capital mark of distinction," says Bishop Warburton, "differing Judaism (*i. e.* the religious doctrines and rites of the Jews) from all other forms of religion: it professes to come from the First Cause of all things, and it condemns every other religion for an imposture. There is nothing more surprising in all pagan antiquity than that, amidst their endless (alleged) revelations, *not one of them ever made such pretensions as these;* yet there is nothing which modern writers are more apt to pass over without reflection. The ancient fathers, however, more nearly acquainted with the state of paganism, regarded it with the attention due to so extraordinary a circumstance."—*Divine Legation of Moses*, book iv. s. 1.

LATITUDINARIANISM.

"Latitudinarianism," says good Bishop Ken, "is the common sewer of all heresies imaginable." The Bishop of London, in his charge at St. Paul's, November 2, 1850, said: "I would desire you (the clergy) to consider whether some of those persons who are disgusted with the departure, now too common, from the soberness and simplicity of our devotional offices, and with exaggerated notions which are insisted on as to the autho-

* The Intellectual and Moral Development of the Present Age, 1853.

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rity of the priestly office, are not too likely to take refuge, not in Low-Church doctrine, as the term is commonly understood, but in the boundless expanse of *latitudinarianism*—a sea without a shore, and with no polar-star to guide those who embark on it but the uncertain light of human reason. I cannot but think that we have more to apprehend from the theology of *Germany* than that of *Rome;* from that which defies human reason than from that which seeks to bind or stifle it."

SYMBOLS OF THE FOUR EVANGELISTS.

Horne, in his *Introduction*, vol. iv. p. 254, says that Irenæus was the first to discover the analogy between the four animals mentioned by Ezekiel (i. 5, 10) and the four Evangelists, which gave rise to the well-known paintings of these latter. He quotes from *Iren. adv. Hær.* lib. iii. cap. 2, "The first living creature, which is like a *lion*, signifies Christ's efficacy, principality, and royalty, viz. John; the second, like a calf, describes his sacerdotal order, viz. Luke; the third, having as it were a man's face, describes his coming in the flesh as man, viz. Matthew; and the fourth, like a flying eagle, manifests the grace of the Spirit flying into the Church, viz. Mark."

PARSONS CALLED "SIRS."

The title "Sir" applied to the clergy is only a translation of "*Dominus*," a common term of respect in the Middle Ages. In the University of Dublin, all Bachelors of Arts are styled "*Domini*;" but in calling rolls, or on any occasion where English is the medium of communication, the term "Sir" is prefixed to the family name. It is also the way in which graduates under masters' standing have their names distinguished on their outer doors. Thus, an undergraduate's door would bear his name as "Jones;" when a B.A., "Sir Jones." The title of "*Dominus*" is also applied to B.A.s at Cambridge; but, for some reason which we cannot explain, at Oxford "*Dominus*" is confined to the doctorate.

ORIGIN OF "CANT."

This word, which is now generally applied to fanaticism and hypocritical conduct, is derived from two Scotch Presbyterian ministers in the reign of Charles II. They were father and son, both named Andrew Cant; and Whitelocke, in his *Memoirs*, after narrating the defeat at Worcester, in 1651, says: "Divers Scotch ministers were permitted to meet at Edinburgh to keep a day of humiliation, as they pretended, for their too much correspondence with the king;" and in the same month, when Lord Argyll had called a parliament, Mr. Andrew

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Cant, a minister, said in his pulpit, that "God was bound to hold this parliament; for that all other parliaments were called by man, but this was brought about by his own hand."

USE OF INCENSE.

Incense, or Frankincense (the *Thus* of the druggist), exudes by incision, and dries as a gum, from *Arbor thurifera;* and was formerly burnt in the temples of all religions, in honour of the divinities that were there adored. Many of the primitive Christians were put to death because they would not offer incense to idols. In the churches of Rome and of the Greek Islands, incense is used at high mass, and in solemn ceremonies, and particularly at the funerals of the hierarchy and other personages of exalted rank. Pure frankincense is frequently mentioned in Exodus.

"It was from this religious custom of employing incense in the ancient temples that the royal prophet drew that beautiful simile of his, when he petitioned that his prayers might ascend before the Lord like incense (Luke i. 10). It was while all the multitude was praying without, at the hour of incense, that there appeared to Zachary an angel of the Lord, standing on the right side of the altar of incense. That the nations attached not only a meaning of personal reverence, but also of religious homage, to an offering of incense, is demonstrable from the instance of the Magi, who, having fallen down to adore the new-born Jesus, and recognised his divinity, presented him with gold, myrrh, and frankincense. The primitive Christians imitated the example of the Jews, and adopted the use of incense at the celebration of the Liturgy. The use of incense in all the oriental churches is perpetual, and almost daily; nor do any of them celebrate their Liturgy without it, unless compelled by necessity. The Coptic, as well as other Eastern Christians, observe the same ceremonial as the Latin Church in incensing their altar, the sacred vessels, and ecclesiastical personages."—*Dr. Rock's Hierurgia.*

Virgil thought that frankincense was only found in Arabia, *Solis est turea virga Sabœis* (G. ii. 117), in which opinion he is followed by Pliny. Vast quantities are gathered from trees growing near to the northern bay of the Red Sea, at the foot of Mount Sinai. It was called *Tus* or *Thus* by the dealers in Egypt, from *Thur* or *Thor*, the name of a harbour in that bay, and therefore distinguished from the gum Arabic, which comes from Suez. Olibanum is, however, believed to have been one of the ingredients in the sweet incense of the Jews; it is still burnt as incense in the Greek and Romish churches; and "incense prepared for altar-service," as supplied by druggists, is nothing more than gum olibanum of indifferent quality, and not at all like the composition as especially commanded by God, the form for which is given in full in Exodus.

Instead of being consumed "upon the altar," incense is now burned in a *censer*, such as is depicted on the temple-walls in Egypt, from Meroë to Memphis; and in the British Museum

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there is a vase (No. 2595), or censer, from an Egyptian catacomb. The censer is now made either of brass, German silver, or the precious metals; it resembles a saucer and an inverted cup, the latter being perforated to allow the escape of the perfume. In the outer saucer is placed an inner one of copper, which can be taken out and filled with ignited charcoal; and this being replaced in the censer, is covered with the incense, and the heat rapidly volatilises it in visible fumes. The effect is assisted by the incense-bearer swinging the censer, attached to three long chains, in the air. The manner of swinging varies slightly in the churches in Rome, in France, and in England, some holding it above the head. At the church of La Madeleine, in Paris, the method is always to give the censer a full swing at the greatest length of the chain with the right hand, and to catch it up short with the left hand. The censer is technically termed a *Thurible*. Pastilles were evidently derived by the French from the use of incense at the altars.

"VINUM THEOLOGICUM."

The best wine formerly made in England was named "Theologicum," because, according to Holinshed, i. 282, "it was had from the clergie and religious men, vnto whose houses manie of the laitie would often send for bottles filled with the same, being sure that they would neither drinke nor be served of the worst, or such as was anie waies mingled or vined by the vintner: naie, the merchant would have thought that his soule would have gone streightwaie to the devil, if he should have served them with other than the best."

"HOLY WATER."

Among the early superstitious sepulchral rites, in France at least, was the interment of vessels containing "Holy Water" in the tombs with the dead. This we learn from Johannes Belithus, an ancient liturgist of the twelfth century; and his statement is confirmed by his commentator, the celebrated Durandus, who, for the use of the holy water, assigns the pious reason, that it was "very unpopular with the demons, and kept them away from the corpse,"—a feeling that has probably been stereotyped in the vulgar saying of "the devil hates holy water."—*W. M. Wylie, F.S.A.; Archæologia*, vol. xxx. p. 302.

ROYALTY DEDUCED FROM A TUB-WOMAN.

In 1768, there appeared in the newspapers the following paragraph: "During the troubles of the reign of Charles I., a country girl came to London in search of a place; but, not succeeding, she applied to be allowed to carry out beer from a

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brewhouse. These women were then called *tub-women.* The brewer, observing her to be a very good-looking girl, took her from this low situation into his house, and afterwards married her; and while she was yet a young woman, he died, and left her a large fortune. She was recommended, on giving up the brewery, to Mr. Hyde, a most able lawyer, to settle her husband's affairs; he, in process of time, married the widow, and was made Earl of Clarendon. Of this marriage there was a daughter, who was afterwards wife to James II., and mother of Mary and Anne, queens of England." This statement was answered by a letter in the *London Chronicle*, Dec. 20, 1768, proving that "Lord Clarendon married Frances, the daughter of Sir Thomas Aylesbury, knight and bart., one of the masters of request to King Charles I., by whom he had four sons: viz. Henry, afterwards Earl of Clarendon; Lawrence, afterwards Earl of Rochester; Edward, who died unmarried; and James, drowned on board the *Gloucester* frigate: also two daughters, Anne, married to the Duke of York; and Frances, married to Thomas Keightley, of Hertingfordbury, in the county of Herts, Esq." The story appears to have been a piece of political scandal. The mother of the Protector, Oliver Cromwell, is said to have conducted with great ability the affairs of her husband's brewhouse at Huntingdon. This some republican spirit appears to have thought an indignity; so, by way of retaliation, he determined on sinking the origin of the inheritors of the crown to the lowest possible grade—that of a *tub-woman!*

The same story has been told of the wife of Sir Thomas Aylesbury, great-grandmother of the two queens; and, for any thing we know yet of *her* family, it may be quite true.

FEMALE SUCCESSION TO THE THRONE OF ENGLAND.

This principle seems to have been indigenous in Britain. Tacitus mentions it as a peculiarity of this nation—"*neque sexum in imperiis discernunt;*" and it is clear that the British crown was in those days inheritable by females. The exclusion of females from the throne of France by what is called the Salic law, is admitted to have been a special departure from a general rule. But our English annals afford a curious and lamentable anomaly on the subject; for, while the *principle* of female succession has never been denied, it has so happened in *practice*, that from the Conquest to the accession of Mary I. —nearly five hundred years—there is not a single instance in which the female heir was not violently deprived of her regal rights, and generally by the next heir male. Matilda, the only surviving child of Henry I., was dispossessed by Stephen, and after his death passed over by her own son. Philippa of Clarence and her issue, heirs to the crown on the death of

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Richard II., were excluded by the usurpation of the next male, Henry IV. and his descendants, which produced those bloody and protracted struggles called, somewhat inaccurately, the contest of the Houses of *York* and Lancaster; for the Duke of York's only title was as the son of Anne, the daughter of Philippa of *Clarence*. Elizabeth, only surviving child of Edward IV., was set aside, first by the next male, her uncle, Richard III.; and subsequently by Henry VII., who, though he was glad to repair his own illegitimate title by a union with her, never acknowledged her separate rights, and affected to transmit the crown to their son, Henry VIII., as the heir of the *Lancastrian* branch, though his real right was as the descendant, through three females and two males, of Lionel of *Clarence*. Fortunately for England, there existed, at the death of Edward VI., no one who could advance any claim to the crown to the exclusion of heirs female; and in the person of Mary was the first time brought into *practice* a principle which was coeval with the monarchy; and the first step being thus made, the vigour, glory, and duration of Elizabeth's reign may be said to have first consecrated the ancient theory of the constitution.—*Quarterly Review*, 1837.

QUEEN VICTORIA I.

There is a disposition to propagate an absurdity quite at variance with all precedent and common sense, by denominating our gracious sovereign Victoria *the First*. Do we ever speak of Matilda *the First*, or John *the First*, or Mary *the First*, or Anne *the First?* The ordinal distinctions can never surely, with propriety, be appended to the name of a monarch until there shall have been a second bearing the same name. On the propriety of styling the especial royal court of judicature, at which the sovereign anciently presided in person, the Court of *Queen's* Bench, some hesitation may arise, determinable, however, by former practice. Does the Saxon derivation of queen extend further, in strict meaning, than a royal consort? and is not the queen regnant *de facto* king, as exercising the kingly office? In the Liturgy, we pray for "our gracious Queen and *governor*," not our *governess*, thus distinguishing at once the sex and the office.—*A. J. Kempe, F.S.A.; Gentleman's Magazine*, 1839.

WOOLSACKS IN THE HOUSE OF LORDS.

When, in the reign of Elizabeth, an act of parliament was passed to prevent the exportation of Wool, to keep in mind this source of our national wealth, Woolsacks were placed in the House of Lords, whereon the judges sit.

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DEGRADATION OF A PEER.

It has been maintained that the king may degrade a Peer; but it is shown from modern authorities, that he cannot be degraded but by an act of parliament. Sir Andrew Harcla, Earl of Carlisle, being attainted and convicted of treason by the 18th Edward III., *coram rege*, after judgment had been pronounced on him, his sword was broken over his head and his spurs were hewn off his heels; Sir Anthony Lacey, the judge, saying to him, "Andrew, now thou art no knight, but a knave." By statute 13 Car. II., William Lord Monson, Sir Henry Mildmay, and others, were degraded from all titles of honour, dignity, and pre-eminence; and prohibited to bear or use the title of lord, knight, esquire, or gentleman, or any coat of arms, for ever afterwards.

LADIES IN PARLIAMENT.

Gurdon, in his *Antiquities of Parliament*, says,—The ladies of birth and quality sat in council with the Saxon Witas. The Abbess Hilda (says Bede) presided in an ecclesiastical synod. In Wighfred's great council at Becconceld, A.D. 694, the abbesses sat and deliberated; and five of them signed decrees of that council along with the king, bishops, and nobles. King Edgar's charter to the Abbey of Crowland, A.D. 961, was with the consent of the nobles and abbesses, who signed the charter. In Henry III.'s and Edward I.'s time four abbesses were summoned to parliament, namely, of Shaftesbury, Berking, St. Mary of Winchester, and of Wilton. In the 35th of Edward III. were summoned by writ to parliament—to appear there by their proxies, namely—Mary Countess of Norfolk, Alienor Countess of Ormond, Anna Despenser, Philippa Countess of March, Johanna Fitzwater, Agneta Countess of Pembroke, Mary de St. Paul, Mary de Roos, Matilda Countess of Oxford, Catherine Countess of Athol. These ladies were called *ad colloquium tractatum* by their proxies, a privilege peculiar to the peerage, to appear and act by proxy.

GLASS-HOUSES AND THROWING STONES.

In the reign of James I., the Scotch adventurers who came over with that monarch were greatly annoyed by persons breaking the windows of their houses; and among the instigators was Buckingham, the court favourite, who lived in a large house in St. Martin's Fields, which, from its great number of windows, was termed the "Glass House." Now, the Scotchmen, in retaliation, broke the windows of Buckingham's mansion. The courtier complained to the king, to whom the Scotch had previously applied; and the monarch replied to

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Buckingham, "Those who live in glass-houses, Stoenie, should be careful how they throw stones;" whence arose the common saying.

"HEAR, HEAR!"

This phrase, originally "hear him," was first used in parliament "to remind members of the duty of attending to the discussion; but gradually became what it now is, that is to say, a cry indicative—according to the tone—of admiration, acquiescence, indignation, or decision."

WHIG AND TORY.

Whenever these terms were first introduced, and whatever might be their original meaning, it is certain that in the reign of Charles II. they carried the political signification which they have retained to our time. Thus, in Dryden's *Epilogue to the Duke of Guise*, 1682:

"Damned neuters, in their middle way of steering,
Are neither fish nor flesh, nor good red herring:
Not Whigs nor Tories they; nor this nor that;
Nor birds nor beasts; but just a kind of bat,—
A twilight animal true to neither cause,
With Tory wings, but Whiggish teeth and claws."

An anonymous scrap says: "The word Whig was given to the Liberal party in England by the royalists in Cromwell's days, from the initials of their motto, 'We hope in God.'"

Mr. Borrow, author of the *Bible in Spain*, suggests that *Tory* may be traced to the Irish adherents of Charles II. during the Cromwellian era; when the words *Tar-a-Ri* (pronounced *Tory*), and meaning, Come, O king, were so constantly in the mouths of the royalists as to have become a byword to designate them.

Mr. D. Urquhart, in his *Familiar Words*, says:

"Whig, or whaig, is the Scotch for whey, which became a sobriquet of drovers, and a representative of bandits. It was first applied as a nickname to those who attempted to resist the oppressions practised against Scotland. Tory came from 'toory,' in Irish, 'give me;' and like the 'perdioses' of Spain, was applied to beggars, and then to outlaws. It became the sobriquet of those who resisted the oppressions of Ireland. In both cases the contemptuous appellation was accepted with pride by those to whom it was applied; in both cases it represented in its origin justice and integrity."

RADICAL.

The application of the term *Radical* arose about the year 1818, when the popular leaders, Henry Hunt, Major Cartwright, and others, sought to obtain a Radical Reform in the representative system of Parliament; it never was applied to the Whigs as a party. Its origin may probably be traced to the

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writings of Lord Bolingbroke, who, in his Discourses on Parties, *Let.* 18, employs the term in its present accepted sense. He says: "Such a remedy might have wrought a *radical* cure of the evil that threatens our constitution," &c.—*Richardson's Dictionary.*

THE TERM "CONSERVATIVE."

This name, as distinguishing a party in politics, is of so recent an origin as January 1830. The word was occasionally used in its literal sense by the elder writers, particularly by Sir Thomas Browne; but had become obsolete, when it was revived in the following sentence in the *Quarterly Review*, vol. xliii. p. 276, in a paper attributed to Mr. Croker: "We despise and abominate the details of partisan warfare; but we now are, as we always have been, decidedly and conscientiously attached to what is called the Tory, and which might with more propriety be called the *Conservative*, party," &c.

ACCEPTANCE OF THE CHILTERN HUNDREDS.

A Member of the House of Commons, not in any respect disqualified, can only vacate his seat by his acceptance of the stewardship of the Chiltern Hundreds, or some other nominal office in the gift of the Chancellor of the Exchequer. The practice began about the year 1750; but the duties of the stewardship have long since ceased, and the office is but retained to serve this particular purpose. The Chiltern Hills are a range of chalk eminences, separating the counties of Bedford and Hertford, passing through the middle of Bucks from Tring in Hertfordshire to Henley in Oxfordshire. Formerly these hills were covered with thick beech-wood, and sheltered numerous robbers; to put these marauders down, and protect the inhabitants of the neighbourhood from their depredations, an officer was appointed under the Crown, called the Steward of the Chiltern Hundreds, which were Burnham, Desborough, and Stoke. The clump of noble "Burnham beeches" remains to remind us of the old stewardship duties.

PUBLIC SPEAKING.

Thomas Moore, in his *Diary*, vol. viii., records the Marquis of Lansdowne to have one day remarked that he hardly ever spoke in the House of Lords without feeling the approaches of some loss of self-possession, and found that the only way to surmount it was to talk on at all hazards. He added, what appears highly probable, that those *commonplaces* which most men accustomed to public speaking have ready cut and dry, to bring in on all occasions, were, he thought, in general used by them as a mode of getting out those blank intervals, when they do not know *what* to say next, but in the mean time must say *something*.

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Nationalities.—Dignities.

THE AMERICAN EAGLE.

DR. FRANKLIN, in one of his admirable Letters, observes:

"I wish the bald Eagle had not been chosen as the representative of our country: he is a bird of bad moral character; he does not get his living honestly; you may see him perched on some dead tree, where, too lazy to fish for himself, he watches the labour of the fishing-hawk; and when that diligent bird has at length taken a fish, and is bearing it to his nest for the support of his mate and young ones, the bald eagle pursues and takes it from him. With all this injustice, he is never in good case; but, like those among men who live by sharping and robbing, he is generally very poor, and often very lousy. Besides, he is a rank coward; the little king-bird, not bigger than a sparrow, attacks him boldly, and drives him out of the district. I am, on this account, not displeased that the figure is not known as a bald eagle, but looks more like a turkey. For, in truth, the turkey is in comparison a more respectable bird, and withal a true original native of America. . . . . He is besides (though a little vain and silly, it is true, but not the worse emblem for that) a bird of courage, and would not hesitate to attack a grenadier of the British guards who should presume to invade his farmyard with a *red* coat on."

"BROTHER JONATHAN."

The origin of this term, as applied to the United States, is as follows: When General Washington, after being appointed commander of the army of the revolutionary war, went to Massachusetts to organise it, he found a great want of ammunition and other means for its defence; and on one occasion it seemed that no means could be devised for the necessary safety. Jonathan Trumbull, the elder, was then governor of the State of Connecticut; and the general, placing the greatest reliance on his excellency's judgment, remarked, "We must consult Brother Jonathan on the subject." The general did so; and the governor was successful in supplying many of the wants of the army: and thenceforth, when difficulties arose, and the army was spread over the country, it became a by-phrase, "We must consult Brother Jonathan;" and the name has now become a designation for the whole country, as John Bull has for England.—*Dictionary of Americanisms, by J. R. Bartlett*, 1842.

"THE STARS AND STRIPES."

The American flag originated in a resolution of Congress, June 13, 1777, "That the flag of the thirteen United States be thirteen stripes, alternately red and white; that the Union be

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thirteen stars, white in a blue field, representing a new constellation." The combination is thought to have been derived from the arms of General Washington, which contains three stars in the upper portion, and three bars running across the escutcheon; if this is not correct, the coincidence is striking. There were several flags used before the striped flag by the Americans. Formerly, a new stripe was added for each new State admitted to the Union, until the flag became too large; when, by Act of Congress, the stripes were reduced to the old thirteen; and now a star is added to the Union at the accession of each new State.—*T. Westcott, Philadelphia; Notes and Queries*, No. 141 (abridged).

SALUTE OF A HUNDRED-AND-ONE GUNS.

Opinions are divided as to the origin of firing 101 rounds on great occasions. Some imagine it to be deduced from the German custom of adding one on almost every occasion,—a custom observable even in the German law, and which has descended into trade and the ordinary affairs of life. Others prefer the following historical origin: On the triumphant return of Maximilian to Germany after a successful campaign, a brilliant reception was offered to the monarch by the town of Augsburg, and a hundred rounds of cannon were ordered to be discharged on the occasion. The officer on service, fearing to have neglected the exact number, caused an extra round to be added. The town of Nuremburg, which Maximilian next visited, desirous to prove itself equally loyal, also ordered a like salute; whence, it is said, proceeds the custom that has descended to our day.

ORIGIN OF LYNCH LAW.

Lynch Law takes its name from the stern and summary act of one James Lynch Fitz-Stephen, a merchant of the Irish town of Galway, and, in 1526, its mayor or warden. The son of this Lynch Fitz-Stephen, having committed a foul murder, his father, exercising his authority as warden, had him arrested and brought for trial before himself. The father, on conviction, Brutus-like, sentenced the son to death, and fearing a rescue from the prison, caused him to be brought home and to be hanged before his own door.

The American system of Lynch Law began in what is now known as the Piedmont country of Virginia, which was at the time the western frontier, and having no law of its own, and being seven miles from the nearest court of criminal jurisdiction, controversies were constantly referred to men of sound judgment and impartiality in the district, whose decisions were regarded as final. Prominent among these was a man whose awards exhibited so much justice, judgment, and impartiality, that he

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was known throughout the country as Judge Lynch. In the course of time criminals were brought before him, and he awarded such punishment as he considered just and proper. There were other persons, in different districts, who acted as arbitrators, and who awarded punishments; but Judge Lynch was the most conspicuous, and consequently the system took his name, and was called Lynch Law. This was a compliment to his integrity and high character. But of late years the term has been regarded as a reproach, because violent and unprincipled men, such men as Lynch was wont to punish, have set the laws at defiance, and while inflamed with passion, or maddened by a thirst for revenge, have usurped the prerogatives of the courts of justice.

"EXCELSIOR."

This is the motto of the United States of America: it signifies literally "Higher," and may be considered to denote the aspiring character of that nation. "Excelsior" is also the title of a sublime poem by Longfellow, whose meaning is thus interpreted by a classic friend:

"Longfellow, in my mind, has a feeling in that beautiful poem not unlike the feeling of his psalm of life under *every* aspect. It is, I take it, an *ideo-religion* of Longfellow's own fine imagination and truly poetic art, and I read the effusion as his view of the *interior career of man.* EXCELSIOR, starting from that sublime point of departure wherein the human soul was placed by the Almighty, 'paulo minus ab angelis,' the individual who wishes to improve himself never finds a halting place on earth. His career is upward, in one sense, whatever it may appear to be. His very degradations are means of increased ennoblement, because of incessant compurgation and purity. And in *one* respect the human almost surpasses the angelic lot; because the one, being perfect in its kind, does not, *perhaps*, admit of progress, and the other does indefinitely. The yearning to fulfil this progressive lot engenders a noble discontent, and that discontent is expressed by the word *Excelsior.* Observe, it is not *Excelsius;* it is therefore entirely interior; whereas *Excelsius* would 'refer to the *circumstances,* rather than to him who was in them."—*Miles Gerald Keon.*

"FILIBUSTERS."

The title of Filibusters is a mere corruption of the English word freebooters—a German term imported into England during the Low-Country wars of Elizabeth's reign. It has been erroneously traced to the Dutch word *flyboat;* but the Jesuit traveller Charlevoix asserts that, in fact, this species of craft derived its title from being first used by the Flibustiers, and

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not from its swiftness. This, however, is evidently a mistake, as Drayton and Hakluyt use the word; and it seems to be of even earlier standing in the French language. The derivation from the English word freebooter is at once seen when the *s* in Flibustier becomes lost in pronunciation.—*G. W. Thornbury.*

NATIONAL FLAGS AND SIGNALS.

Red, white, yellow, and blue, are found to be the most conspicuous colours. The present French red, white, and blue is a good example of conspicuous effect produced by the simplest possible combination of the three colours in the same flag. Our royal standard has a groundwork in some parts red and in others blue, with yellow or golden lions, and harps, and so forth. Our Admiralty flag has a yellow anchor on a red ground. Our Union flag has a blue ground, red rectangular stripes, and white diagonals. Our red and blue admiral's flags are plain. Many of the other English flags have a plain ground colour over five-sixths of the surface, but with a cross of stripes in one corner. So it is throughout most of the nations of Europe. The colours on the naval flags are generally red, white (or yellow), and blue. Even his Holiness the Pope has one flag with a white lamb and a white cross on a red ground; and another with a yellow St. Peter on a red ground. King Bomba (of Naples) has a yellow griffin on a white ground. Hamburgh has a white castle on a red ground. Venice has an amiable-looking yellow lion on a red ground, holding a yellow sword in one paw, and a white book in another. Bremen has a sort of red and white chess-board, with six times nine squares instead of eight times eight; and so on. Every where we find red, white, and blue, or red, yellow, and blue; and we may be certain that something better than mere freak determines the selection of such colours as signals.—Abridged from *Dickens's Household Words.*

THE UNION JACK.

The British Flag consists of the crosses of St. George, St. Andrew, and St. Patrick, united; but the etymology of the term "Union Jack" has never, it is presumed, been explained, for it does not occur in any lexicon or glossary. The word "Union" obviously arose from the event to which the flag owes its origin (the Union of Ireland, in 1801); the only difficulty, therefore, is as to the expression "Jack." As the alteration in the banner of St. George occurred in the reign of James I., it may with great probability be supposed to be a corruption of "Jacques." If, however, this hypothesis be rejected, the following is submitted. English soldiers were formerly accustomed to wear the cross of St. George on their

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upper garment; and as it appears from early writers that the upper dress of a horseman, and, according to others, a coat of mail, was called "a Jack," it admits of the inference that a small flag containing the cross in question was termed "a Jack," when used at sea; after the banner, which more properly speaking is confined to the field, fell into comparative disuse. The former of these conjectures appears, however, the more probable.—*Sir Harris Nicolas; Naval and Military Mag.* 1827.

ISLE-OF-MAN ARMS.

The arms of the Isle of Man are, *gules*, three legs conjoined in the fess-point, &c., *or*. The symbol of three legs conjoined no doubt denotes the triangular shapes of the Isle of Man, and Sicily or Trinacria. It is somewhat curious, that the earliest coinage of this island, A.D. 1709 (which, by the way, is cast, and not struck in the usual way: obverse, the crest of the Earls of Derby, the eagle and child, SANS CHANGER; reverse, the three legs), has the motto QVOCUNQUE GESSERIS STABIT. The coinage of 1723 is exactly similar, but struck; whereas that of 1733, and all the succeeding coinages, have QUOCUNQUE JECERIS STABIT, which is clearly the correct reading.—*E. S. Taylor, the Numismatist.*

NAPOLEON'S "BEES."

Napoleon I., wishing to have some regal emblem more ancient than the *fleur-de-lys*, is said to have adopted the Bee under the following circumstances. When the tomb of Childeric (the father of Clovis) was opened in 1653, there were found, besides the skeletons of his horse and page, his arms, crystal orb, &c.; there were also found more than 300 models of what the French heralds mistook for bees, "of the purest gold, their wings being inlaid with a red stone, like cornelian." These "bees" were accordingly sprinkled over the imperial robe, as emblematical of enterprise and activity. But these small ornaments, *resembling bees*, were only what in French are called *fleurons* supposed to have been attached to the harness of the war-horse. Handfuls of them were found when the tomb was opened at Tournay, and sent to Louis XIV. They were deposited on a green ground at Versailles, which was adopted by Napoleon as the original Merovingian colour. This fact was related to Mr. W. Ewart, M.P., by Augustin Thierry, the celebrated historian.

THE ZOLL-VEREIN,

or Customs' Union, is a union of smaller states with Prussia for the purpose of customs' uniformity, first commenced in 1819, by the union of Schwarzburg-Sondershausen, and which now includes Prussia, Saxony, Bavaria, Wurtemberg, Baden, Hesse-Cassel, Brunswick, and Mecklenburg-Strelitz, and all interme-

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diate principalities. For the purposes of trade and customs, these different kingdoms and principalities act as one empire.

SOLDIER AND VOLUNTEER.

The title of Soldier is derived from *solidus*, a piece of money. The Roman legions were *paid*. Hence the Volunteer, whose gallantry was gratuitous, was said to be "no soldier." A good *solidus*, weighing sixty-seven grains, having on the obverse a bust with full face, and on the reverse a cross within a wreath (from the Earl of Pembroke's celebrated collection of rare and unique coins), was sold by Sotheby and Co., in 1848, for 59*l*.

THE TITLE "ADMIRAL."

Admiral (says Mr. J. Craufurd) is derived from the Arabic, *amir*, a noble, a prince, a commander-in-chief; and *bahar*, the sea or a fleet, with the article *al* prefixed. *Amir al bahar*, therefore, means commander of the sea or of the fleet. The word has evidently come into French from Spanish, and from French into English. In Spanish the Arabic is corrupted into *almirante* to express the commander, and into *almiraute* to designate the flag-ship. The *d* was added in English, probably from some notion of euphony. But originally the word, whether to express the admiral himself or the ship he commanded, was written as both are at present in French. For the flag-ship Milton writes the word *amiral*, as in describing Satan's spear:

"To equal which the tallest pine,
Hewn on Norwegian hills to be the mast
Of some great amiral, were but a wand
He walked with to support uneasy steps."

THE NABOB

is derived from *nawab*, the plural of *naib*, a deputy or lieutenant; but in the popular language of India, from which the word is come to us, the plural is used for the singular. Sir T. Herbert, whose Travels were published in 1634, spells the word *nabobb*, and defines it, "a nobleman in the language of the Mogul's kingdom, which hath mixed up with it much of the Persian." Gilchrist, in his *Vocabulary*, gives *nabob* or *nabab* as a corruption from the Hindustani *nuwab*, which was the title of the governor of a province under the Mogul empire, such as the Nuwab of Arcot, Oude, etc. Several of these became gradually independent during the decline of the empire, and subsequently either allies or dependents of the Anglo-Indian Government. The word *nabob* was formerly used in Europe to mean a wealthy man who had made his fortune in India; and Dr. Knox, in his very able work, the *Spirit of Despotism*, has some clever remarks upon the character and conduct of this class of men.

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Science, the Arts, and Manufactures.

APPLICATIONS OF SCIENCE.

Dr. Arnott has adduced these interesting facts to show that the tasks of purely scientific research, and of the subsequent applications to art, have lain very much with different parties. It was not, for example, the chemist who first showed a jet of coal-gas burning in his laboratory, who also first conceived and accomplished the noble feat of lighting up with gas a whole city, so as almost to make night there appear the day. It was not the person who, ages ago, observed the expansive force of steam, and its sudden collapse again into water when cooled, who thought of turning steam-force to profitable use; for it was left to James Watt, almost in our own day, to devise the present steam-engine, which has quickly spread a newer and higher civilisation over the earth. Then, for many a day was the fact widely known, that a shock of electricity travelled along a wire with the speed of lightning, before Wheatstone and others who still live among us, had constructed the electric telegraph, which, with the speed of lightning, can deliver at any distance, and can even write down or print, the words of any message committed to it.

ECONOMY OF CHEMISTRY.

The Chemistry of Art, like a prudent housewife, economises every scrap. The horse-shoe nails dropped in the streets during the daily traffic are carefully collected by her, and re-appear in the form of swords and guns. The clippings of the travelling tinker are mixed with the parings of horse's-hoofs from the smithy, or the cast-off woollen garments of the poorest inhabitants of a sister isle, and soon afterwards, in the form of dyes of brightest blue, grace the dress of courtly dames. The main ingredient of writing-ink was, possibly, once part of the broken hoop of an old beer-barrel. The bones of dead animals yield the chief constituents of lucifer-matches. The dregs of port-wine, carefully rejected by the port-wine drinker in decanting his favourite beverage, are taken by him in the morning in the form of Seidlitz powders, to remove the effects of his debauch. The offal of the streets and the washings of

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coal-gas re-appear carefully preserved in the lady's smelling-bottle, or are used to flavour blancmanges for her friends. This economy of the chemistry of art is only in imitation of what we observe in the chemistry of nature. Animals live and die; their dead bodies, passing into putridity, escape into the atmosphere, whence plants again mould them into forms of organic life; and these plants, actually consisting of a past generation, form our present food.—*Dr. Lyon Playfair.*

THE FIXED ALKALIS.

Potash and Soda (to which has been added Lithia) were named *fixed alkalis*, from having for centuries resisted all the attempts of chemists to decompose them, and they were therefore considered as simple bodies; but, in 1806, Sir Humphry Davy, by a skilful application of galvanism, succeeded in demonstrating that they were compound bodies; potash and soda being respectively made up of a metallic basis and oxygen.

SPONTANEOUS COMBUSTION.

This question has been much discussed of late years; but Liebig, in his *Familar Letters upon Chemistry*, is considered to have proved conclusively:

1. That of the cases adduced, none is well authenticated; while in most it is admitted that the victims were drunkards, and that generally a candle or lamp was in the room, and after the alleged combustion was found turned over. 2. That spontaneous combustion was absolutely impossible, the human frame containing 75 or 80 per cent of water; and since flesh, when saturated with alcohol, is not consumed upon the application of a light, the alcohol burning off first, the causes assigned to account for the spontaneous ignition are *à priori* extremely improbable.

Nevertheless, Dr. Lindley has compiled a table of nineteen instances from the *Dictionnaire de Médecine*, of something akin to spontaneous combustion: namely, the rapid ignition of the human body (which *per se* is not combustible) by contact with flame, as a consequence of the saturation of its tissues by alcohol.—See *Notes and Queries*, No. 184.

CAN FIRE BE PRODUCED FROM THE AGENCY OF TWO STICKS?

A Correspondent of the *Lancet*, writing from Fort Vancouver, states, that from inquiry among the Hudson's Bay Company's officers, he has no doubt that the Indians produce fire by rubbing two sticks together. Lieutenant Talbot, who was with Colonel Fremont's Expedition, also states, that to the south of the Columbia, and to the east of the Sierra Nevada, are many tribes who have no other means of producing fire, as they have no iron among them. In the snake-country, also, or south branch of the Columbia, an Indian is not considered properly equipped without his fire-stick, which is always attached to his quiver.

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SPONTANEOUS HEATING OF CAST-IRON.

Cast-iron, when brought into the air after it had been for many years under salt and water, has become red-hot. Thus, in June 1836, some cannon-balls were raised from the ship *Mary Rose*, which sunk in a naval engagement off the Isle of Wight in July 1545, nearly 300 years before. These balls all became red-hot on exposure to the air, and fell to pieces. The cast-iron gratings, after being long immersed in the porter-vats in the large breweries of London, grow hot from a similar cause when the porter is drawn off.—*Mr. Wilkinson; Proc. Asiatic Society*, 1840.

COMBUSTIBILITY OF METALS.

In a "Lecture for the Young," Prof. Faraday put shreds of zinc, in the form of a tassel, into a jar of oxygen; when they burnt like paper. The combustion of iron was illustrated by the friction of steel. Copper and tin were burnt at a small charcoal-furnace. Antimony and iron, after burning some time at a furnace, were thrown down upon a frame, and continued to burn in globules until consumed.

IMPURE WATER.

It is a mistake to suppose that water, because it contains animalcules or confervæ, is necessarily unwholesome. However repugnant to our feelings it may be to use water containing these foreign bodies, it is only when they are dead and putrid that danger arises from their presence.—*Dr. Daubeny.*

STEAM FROM THE KETTLE.

The Steam which issues from the spout of a tea-kettle is no hotter, as measured by a thermometer, than the boiling liquid within; yet when condensed in a body of cold water or ice, it gives out as much heat as one thousand times its weight of boiling water would do. This heat of steam, which is insensible to the thermometer, is called latent heat, and it differs in quantity for different kinds of vapour.—*Dr. Ure.*

POKER ACROSS THE FIRE.

Why does a poker laid across a dull fire revive it? Because the poker receives and concentrates the heat, and causes draught through the fire.

Boswell and Johnson held a conversation upon this domestic phenomenon, as follows: *Boswell.* "Why, sir, do people play this trick which I observe now, when I look at your grate, putting the shovel against it to make the fire burn?" *Johnson.* "They play the trick, but it does not make the fire burn. *There* is a better (setting the poker perpendi

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cularly up at right angles with the grate). In days of superstition they thought, as it made a cross with the bars, it would drive away the witch."

Upon this it is noted: "It certainly does make the fire burn; by repelling the air, it throws down a blast on the fire, and so performs the part, in some degree, of bellows. This observation, by Dr. Kearney, applies only to the *shovel;* but by those who have faith in the experiment, the *poker* is supposed to be equally efficacious."

Croker, in his edition of Boswell's *Life of Johnson*, notes: "After all, it is possible that there may be some magnetic or electrical influence which, in the progress of science, may be explained: and what has been thought a vulgar trick may be proved to be a philosophical experiment." We do not agree with him.

PROGRESS OF GAS-LIGHTING.

The use of Gas was first introduced in 1792, in Cornwall, for lighting a house; in the year 1798, for lighting a manufactory at Soho; in the year 1807, at the Roman Catholic College of Stonyhurst; in 1809, the first Gas Company was formed in London; in 1855, there were fourteen Gas Companies for supplying London; the total number now in Great Britain being about one thousand. In 1824, there were 50,000 tons of coal used in the production of gas in London; in 1851, there were 500,000 tons used in one establishment. In 1817, the price of gas in London was 15*s.* per 1000 cubic feet; in 1855, it was 4*s.* 6*d.* The cause of this great progress is evident when we consider that gas-light is cleanly, and free from the risk of firing premises; but particularly when we compare the cost of light from candles, lamps, and gas: 1 lb. of tallow-candles at 8*d.* per lb., equals 21 cubic feet of common gas, costing 1¾*d.*, at the rate of 7*s.* per 1000; 1 gallon of solar oil at 5*s.* equals 175 cubic feet of gas, costing 1*s.* 6¼*d.* at 7*s.* per 1000.

Dr. Johnson is thought to have had a prevision of this change; when one evening, from the window of his house in Bolt Court, he observed the parish lamp-lighter ascend the ladder to light one of the glimmering oil-lamps. He had scarcely descended the ladder half-way when the flame expired: quickly returning, he lifted the cover partially, and thrusting the end of his torch beneath it, the flame was instantly communicated to the wick by the thick vapour which issued from it. "Ah," exclaimed the doctor, "one of these days the streets of London will be *lighted by smoke!*"—See *Notes and Queries*, No. 127.

No invention of our time met with such opposition as Gas-lighting. When, in 1809, Winsor applied to Parliament to charter a Company to light the streets, the testimony of Accum, the chemist, in favour of the practicability of Gas-lighting was bitterly ridiculed by Mr. Brougham, F.R.S., the equally bitter assailant of Dr. Young's Undulatory Theory of Light. Again, Sir Humphry Davy, the president of the Royal Society, asked the inventors "if it were intended to take the dome of St. Paul's for a gasometer;" and a deputation of fellows of the Royal Society, on visiting the first established gas-works in London, speculated upon the

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most frightful consequences from the leakage and explosion of the gasometer.—See *Curiosities of London*, p. 324.

THE ELECTRIC CURRENT AROUND THE GYMNOTUS.

Prof. Faraday considers it not at all impossible that the Gymnotus may have the power of throwing each of its four electric organs separately into action, and so, to a certain degree, *direct the shock; i.e.* he may have the capability of causing the electric current to emanate from one side, and at the same time bring the other side of his body into such a condition that it shall be as a non-conductor in that direction. But Mr. Faraday thinks the appearances and results forbid the supposition that the Gymnotus has any control over the direction of the currents after they have entered the fluid and substances around him.

A gymnotus was kept alive at the Adelaide Gallery, Strand, three years and eight months, from August 1838 to March 1842. The most beautiful experiment performed by its electricity was in setting fire to a piece of silver-paper in a brass cylinder; one end of a conductor was attached to the paper and the other to the eel, and by this means the paper was burnt.

Two persons who were suffering from rheumatism, after receiving a few shocks from this gymnotus, were entirely restored. It is stated by Mr. W. C. Thomson, in the *Edinburgh New Philosophical Journal*, No. 4, that on the river Old Calabar, the electric properties of the fish are made use of by the natives as a cure for their sick children. The fish is put into a dish containing water, and the child made to play with it; or the child is put into a tub with water, and one or more of the fish put in beside it.

COSTLINESS OF THE ELECTRIC LIGHT.

There is one serious drawback against the use of Voltaic Electricity for the purpose of illumination, and that is its serious expense. It is a primary law of nature, that no power can be obtained without a corresponding change of matter. In voltaic batteries, the combination of zinc with the oxygen of water constitutes the change of matter which gives rise to electricity. As much dearer as zinc is than coal gas, so is the cost of the voltaic light over the ordinary mode of illumination. But the expense is even still greater, inasmuch as the equivalent of zinc is five times higher than that of carbon; and furthermore, carbon combines with two equivalents of oxygen to form carbonic acid. For this reason the Electric Light will, probably, for ever remain a pretty scientific toy, unless, indeed, some person shall have the good fortune to discover a battery with a carbon positive pole.—*A. Smee, F.R.S.*

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ELECTRO-GILDING A CATHEDRAL.

Perhaps the largest application of the Electrotype or Galvanoplastic process has been made in the cathedral of St. Isaac, at St. Petersburg. The dome is superbly electro-gilded with 247 lbs. of ducat gold; the metal employed in its construction is: copper, 52½ tons; brass, 321½ tons; wrought-iron, 524½ tons; cast-iron, 1068 tons. Total, 1966½ tons.

THE ELECTRIC TELEGRAPH SIMPLIFIED.

A magnetic needle, suspended in such a manner that it is free to turn in any direction, takes a position from north to south, with a little deviation. By simply being able to understand the property of this needle, man can steer his course over the vast expanse of the ocean, even when he is unable to see the land. By it, man can traverse the densest forest, or the most dreary desert, when neither sun, moon, nor stars are visible for days and days.

Now, we find that, if we have a magnetic needle, and pass a current of electricity parallel to it, the needle is deflected across the current of electricity. By taking advantage of a knowledge of this deflection, Cooke and Wheatstone have far outstripped the velocity of the carrier-pigeon, the swiftest horse, or the most rapid railway-train, in the rate at which messages may be transmitted from place to place. For the purpose of working the telegraph, they place along the railway-lines wires, which extend in one continuous length from station to station. Whenever the voltaic force passes, it acts upon the needles at the opposite end. This action represents a sign; and by using these signs upon a pre-concerted plan, the messages are sent.—*A. Smee, F.R.S.**

SCIENTIFIC PROPHECY.

Newton expressed his deliberate opinion, that cohesion, light, heat, electricity, and the communication of the brain with the muscles, were all to be referred to one and the same cause,—an ether or spiritus which pervades all bodies. When we remember Newton's prediction, that the diamond would be found to be combustible, that the earth was between five and six times its weight of water, and other predictions which have proved correct, we feel something like a presentiment that the above opinion may prove as true.

THE DIAMOND.

The word Diamond is derived, through the French *diamant*, from the Greek word ἀδάμας, invincible, and this again from

* See Dr. Lardner's admirable work, *The Electric Telegraph Popularised*, 1855.

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a and *δαμάω*, to crush or subdue,—from its supposed property of resisting the action of fire, and the heaviest strokes of the hammer. The full-grown diamond exceeds in value more than a hundred thousand times its mass in gold: it is the most cherished property and the proudest ornament of kings; it is the most prized and the brightest jewel in the chaplet of beauty; and yet it is but a lump of coal, which heat reduces to a cinder, and dissipates into that insalubrious gas which ascends from the most putrid marsh, and bubbles from the filthiest quagmire.

Sir Isaac Newton conjectured, from its high refractive power, that the diamond was "an unctuous substance coagulated;" and in 1694, a diamond of nearly four carats was so volatilised by a burning-glass at Florence, that the pieces into which it broke were dissolved. The same experiment has often been repeated; and in our own days, Sir H. Davy, with the Grand Duke of Tuscany's burning-glass, found that a diamond introduced into a glass globe supplied with oxygen, and kindled by the solar rays, continued to burn after it was removed from the focus. Carbonic-acid gas was the exclusive result of the experiment. Sir George Mackenzie, of Coul, was the first person in this country who burned diamonds, making a free use of his mother's jewels; and by means of diamond powder, he converted iron into steel. Mr. Smithson Tennant, in America, volatilised a diamond in a gold tube with a stream of oxygen, and found that the oxygen gas was transformed into an equal volume of *carbonic-acid gas*.

The diamond is the hardest of all mineral bodies, scratching zircon, sapphire, ruby, rock-crystal, and all the gems, and cannot be scratched by any of them. Its superiority as an ornamental gem depends, not only on its high refractive power, which alone separates the colours of white light to a very great degree, but also on its low dispersive power, which prevents them from being separated too much, and detained, as it were, within the stone, or rather prevented from emerging from it after reflection.

Diamonds are cut by a horizontal iron plate, about ten inches in diameter, called a schyf, which revolves from 2000 to 3000 times per minute. The diamond is fixed in a ball of lead which is fitted to an arm, one end of which rests upon the table in which the plate revolves, and the other, at which the ball containing the diamond is fixed, is pressed upon the plate by movable weights, varying, according to the size of the facets to be cut, from two to thirty pounds.

It is difficult to express in words or in numbers the commercial value of the diamond; but we may truly say, that a string of Koh-i-noors a furlong in length would purchase the fee-simple of the globe, while a ring engirdling the Arctic Zone

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would buy up the whole planetary system.—*Sir David Brewster; North British Review*, No. 35.

Ground to impalpable powder, coke constitutes the true "Diamond Paste" for sharpening razors, and is the only secret.

CONVERSION OF THE DIAMOND INTO COKE.

Several years since, John Murray, the chemist, of Hull, imbedded a fragment of Diamond in a nidus of hydrate of magnesia; and having submitted it to the intense flame of the oxy-hydrogen blowpipe, the diamond parted suddenly into minute fragments, displaying on their surfaces, as determined by the lens, minute conchoidal fragments, and became *as black as jet!* —*Memoir on the Diamond*, 2d edit. 1839.

HOW THE DIAMOND CUTS GLASS.

Dr. Wollaston ascertained that the parts of the Glass to which the Diamond is applied are forced asunder, as by a wedge, to a most minute distance, without being removed; so that a superficial continuous crack is made from one end of the intended cut to the other. After this, any small force applied to one extremity is sufficient to extend this crack through all the whole substance and across the glass; for, since the strain at each instant in the progress of the crack is confined nearly to a mathematical point at the bottom of the fissure, the effort necessary for carrying it through is proportionally small. Dr. Wollaston found by trial that the cut caused by the mere passage of the diamond need not penetrate so much as the two-hundredth part of an inch. He found also that other mineral bodies, recently ground into the same form, are capable of cutting glass; but they cannot long retain that power, from want of the requisite hardness.

VALUE OF DIAMONDS.

Diamonds are in general weighed by the carat, equivalent to four grains. Thus, says Mr. Tennant, the mineralogist,

1 carat is worth . . .	£8	10 carats are worth .	£300
2 carats are worth . .	16	20 ,, ,, . .	3,300
3 ,, ,, . .	72	30 ,, ,, . .	7,200
4 ,, ,, . .	128	50 ,, ,, . .	20,000
5 ,, ,, . .	200	100 ,, ,, . .	80,000

"PARISIAN DIAMONDS."

These beautiful imitations of "the priceless gem" are made by a chemist in Paris, and are only the oxide of tin. After exposure for some time, they become as dull as common glass.

HOW TO DISTINGUISH PRECIOUS STONES.

The Diamond and the Garnet are distinguished from all other precious stones by their having only *single refraction*, the others

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having *double refraction*, or giving a *double* image of a taper or small light when it is viewed through their facets. By the same means all precious stones, except Diamond, Garnet, and Spinelle, are distinguished from artificial ones by the former having double refraction, and the latter only single refraction. Even when the precious stones are set opaque, that is, when we cannot see through them, it is easy to find whether the refraction is single or double, by looking into the stone at the image reflected from the posterior facets. If any of the precious or artificial stones are immersed in alcohol, or even water, they lose their lustre, while the diamond does not. This arises from their having an inferior refractive, and consequently reflecting power, so that the light reflected from their facets is very small compared with that which comes from the diamond. On a modification of this principle Sir David Brewster has constructed an instrument, which he calls a *lithoscope*, for distinguishing precious stones from one another, and from their imitations.

A well-known though generally ill-practised method of distinguishing precious from artificial stones is, to *touch them with the tongue*. The stone being the best conductor of heat will feel cold, and the glass much less so. The two should, previous to the experiment, be placed close to each other, till they have acquired the same temperature.—*North British Review*, No. 35.

RAILWAY SPEED.

The ordinary rate of speed is per second, of a man walking, 4 feet; of a good horse in harness, 12; of a reindeer in a sledge on the ice, 26; of an English race-horse, 43; of a hare, 88; of the wind, 82; of sound, 1038; of a 24-pound cannon-ball, 1800. These calculations are taken from a French writer. The comparison might be carried with advantage a little farther. A railway steamer, travelling at the ordinary rate of 30 miles an hour, performs 44 feet per second, which is eleven times the speed of the man walking, nearly four times that of the good horse, twice that of the reindeer, and only about one half less than that of the wind itself. But man, horse, and reindeer, all soon become exhausted; while the railway steamer is as fresh and strong at the end of a long journey as at first starting: miles to it are but as paces to others. Racers, such as the Flying Childers, might possibly rival the steamer for the last half of a single-mile heat; but we know a Firefly that could do more miles in one day than 360 Flying Childerses. Again, a racer doing one mile in two minutes, and no more, can but carry a feather-weight for that brief time and distance; while the steamer could draw the Grand Stand, and half the sporting world along with it, from Doncaster to Newmarket, and from Newmarket to Ascot—all in one day.

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THE "NAVVY."

This term has become almost naturalised, and now is understood to mean a labourer employed in the construction of a railway. It is a corruption of the word "navigator;" but what has a navigator to do with railways? Before the age of railways, "navigable canals" were the order of the day: and the labourer employed in their construction was, with some propriety, called a navigator. When railways superseded canals, the labourer very improperly was continued to be called a navigator, or, as now corrupted, a "navvy;" whereas the word "excavator" would have been better.

One of the earliest railway navvies was the late Sir Edward Banks, who worked as a labourer on the Merstham railway, in Surrey, about the year 1801. He subsequently rose to be the builder of three of the noblest bridges in the world, Waterloo, Southwark, and London, and was knighted upon the completion of the latter great work.

FORCE OF STEAM.

The mechanical force of a jet of high-pressure steam has been shown by Prof. Faraday causing it to sustain an egg, which was seen dancing about in the air without any thing apparent to support it.

COFFEE A DISINFECTANT.

Coffee is a powerful deodoriser: it has instantly destroyed the smell of putrefying meat; and in half a minute it has permanently cleared a house of the effluvium of a cesspool. To use coffee for these disinfecting purposes, dry the raw bean, pound it in a mortar, and roast the powder on a moderately heated iron plate until it is of a dark brown tint; then sprinkle it in sinks or cesspools, or lay it on a plate in the room which you wish to have purified. Coffee-acid or coffee-oil acts more readily in minute quantities.

NUTRIMENT IN COFFEE.

M. Payen shows that Coffee, *slightly roasted*, contains the maximum of aroma, weight, and nutrition. He declares coffee to be very nutritious, as it contains a large quantity of azote; three times as much nutriment as tea, and more than twice the nourishment of soup (*bouillon*). Chicory contains only half the nutriment of coffee. M. Payen has also obtained from coffee a crystalline extract capable of giving a deep green colour to five thousand times its weight of water or spirit.

POISON OF NICOTINE.

Smokers, by inhaling the fumes of tobacco, introduce into their system a certain quantity (though small) of poisonous matter, or Nicotine. When pure, its acrid smell slightly re-

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sembles that of tobacco; but when volatilised by heat, it throws out vapours which are so oppressive, that breathing becomes difficult in a room where a drop of the liquid has been spilled. M. Orfila killed many dogs by applying five drops of nicotine on their tongues; with twelve drops, death ensued in twelve minutes. Two drops applied to the tongue of a cock caused death almost instantaneously. Nicotine can be detected as easily as mineral poisons; and when Gustave Foignies was poisoned by the Count Bocarmé, a few years since in Belgium, with nicotine, it was detected by M. Stas in the flooring of the dining-room wherein Gustave died, although that flooring had been washed with soap, oil, and warm water.

CIGARS.

The finest tobacco in the world comes from the Havannah. But there is only a limited area in Cuba in which that tobacco is produced; so that whilst the Havannah tobacco may be of excellent quality in general, the best is the produce of a very small area, and is chiefly used in the island or as presents, a very limited amount going into general consumption. Tobacco, scarcely inferior to that from Havannah, has, however, been brought from Trinidad, and the southern Russian provinces. Manufacture, on the other hand, exercises a great influence over the quality of tobacco. In Algiers, where the climate is most favourable, the cigars are not smokable, because they are badly prepared. Again, some English-made cigars are of much greater excellence than many of the cigars imported from Havannah, and paying the highest duty as manufactured tobacco; and there is no doubt whatever that it is quite practicable to make cigars in this country which shall be undistinguishable in appearance, and not very distinguishable in flavour, from any except those first-class Havannah cigars which scarcely ever come into consumption.—*Dr. Lyon Playfair.*

ARTIFICIAL ESSENCE OF FRUITS, AND NEW SOURCES OF PERFUMES.

An ingenious application of the science of chemistry has of late years been made in the manufacture of Artificial Essences of pears, pine-apples, and other fruits. In the concentrated form the smell is rather acrid; but when diluted, the resemblance to the fruit is recognised. The best imitations are the pine-apple and the jargonelle pear; the green-gage, apricot, black currant, and mulberry, when properly mixed, are fair imitations. They are quite innocuous in the proportions used, namely, a drop and a half to the ounce: the cheap ices are flavoured with these essences. Their introduction originated in the discovery of the fact, that the peculiar flavour of "pine-

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apple rum" was due to butyric ether, which has since been obtained from the fruit itself.—*Jacob Bell.*

The jury in the Great Exhibition of 1851, or rather two distinguished chemists of that jury, Dr. Hoffman and Mr. De la Rue, ascertained that some of the most delicate perfumes were made by chemical artifice, and not, as of old, by distilling them from flowers. The perfume of flowers often consists of oils and ethers, which the chemist can compound artificially in his laboratory. Commercial enterprise availed itself of this fact, and sent to the Exhibition, in the form of essences, perfumes thus prepared. Singularly enough, they are generally derived from substances of intensely disgusting odour. A peculiar fetid oil, termed "fusel oil," is formed in making brandy and whisky. This fusel oil, distilled with sulphuric acid and acetate of potash, gives the oil of pears. The oil of apples is made from the same fusel oil by distillation with sulphuric acid and bichromate of potash. The oil of pine-apples is obtained from a product of the action of putrid cheese on sugar, or by making a soap with butter, and distilling it with alcohol and sulphuric acid, and is now largely employed in England in the preparation of pine-apple ale. Oil of grapes and oil of cognac, used to impart the flavour of French cognac to British brandy, are little else than fusel oil. The artificial oil of bitter almonds, now so largely employed in perfuming soap and for flavouring confectionery, is prepared by the action of nitric acid on the fetid oil of gas tar. Many a fair forehead is damped with eau de millefleurs, without knowing that its essential ingredient is derived from the drainage of cowhouses.—*Dr. Lyon Playfair on the Results of the Exhibition of* 1851.

ANTIQUITY OF PERFUMES.

Pliny describes a mixture of dried flowers and spices, corresponding with the *pot-pourri* of the modern perfumer.* Frangipani Powder (spices, orris-root, and musk or civet), was invented by one of the earliest of the Roman nobles named Frangipani.† The Egyptian ladies carried a little pouch of odoriferous gums, as the Chinese do to the present day. Several passages in Exodus prove the use of perfumes at a very early period among the Hebrews, as "sweet spices, stacte, and onycha, and galbanum, with pure frankincense;" and the "bdellium" mentioned by Moses in Genesis is a perfuming gum

* Among the curiosities shewn at Alnwick Castle, is a vase that was taken from an Egyptian catacomb. It is full of a mixture of gum, resins, &c. which evolve a pleasant odour to the present day, although probably 3000 years old.—*Piesse's Art of Perfumery.*

† Mutio Frangipani was an alchemist of some repute, who invented a stomachic which he named *ro-solis, ros-solis*, sun-dew. We owe the Frangipane tart to the same illustrious source.

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resembling frankincense, if not identical with it. Perfumes were also mixed with the oil and wax for the lamps and lights commanded to be burned in the house of the Lord. Galen, the celebrated physician of Pergamos, who lived about 1700 years ago, invented the *ceratum Galeni*, the cold cream of the present day. In southern Italy so great was the trade in unguents and perfumes, that the unguentarii or perfumers are said to have filled the great street of ancient Capua.—Abridged from *Piesse's Art of Perfumery.*

ANTIQUITY OF SOAP.

The word Soap or Sope, from the Greek *sapa*, first occurs in the works of Pliny and Galen. Pliny states soap to have been first discovered by the Gauls, that it was composed of tallow and ashes, and that the German soap was reckoned the best. According to Sismondi a soap-maker was included in the retinue of Charlemagne. At Pompeii (overwhelmed by an eruption of Vesuvius, A.D. 79), a soap-boiler's shop, with soap in it, was discovered during an excavation made there not many years ago.—(*Starke's Letters from Italy.*) Hence the manufacture of soap is of very ancient origin; indeed Jeremiah figuratively mentions it—"For though thou wash thee with natron, and take thee much sope, yet thine iniquity is marked before me" (Jer. ii. 22).

POMATUM

is named from *pomum*, an apple, because it was originally made by macerating over-ripe apples in grease. Dr. Quincy saw this receipt more than a century since: "Kidd's grease, an orange sliced, *pippins*," &c.; but he adds: "the apple is of no significance at all in the recipe."

PATCHOULY.

This popular perfume is obtained from an otto contained in the leaves and stems of a herb which grows extensively in India and China, and resembles our garden sage. Its odour is the most powerful of any derived from the botanic kingdom. In its pure state it has a kind of mossy or musty odour, analogous to Lycopodium, or as some say, it smells of "old coats." Chinese or Indian ink is scented by some admixture of Patchouly. Its introduction into Europe as a perfume was as follows:

A few years ago, real Indian shawls bore an extravagant price, and purchasers distinguished them by their odour; in fact they were perfumed with patchouly. The French manufacturers had for some time successfully imitated the Indian fabric, but could not impart the odour. At length they discovered the secret, and began to import the plant to perfume articles of their make, and thus palm off home-spun shawls as real Indian! From this origin the perfumers have brought it into use. The leaves, powdered and put into muslin sacks, prevent clothes from being attacked by moths.—*Piesse's Art of Perfumery.*

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PERFUMES AS PREVENTIVES OF MOULDINESS.

Mouldiness is occasioned by the growth of minute vegetation. Ink, paste, leather, and seeds most frequently suffer by it. A clove will preserve ink; any essential oil answers equally well. Leather may be kept free from mould by the same substances. Thus, Russian leather, which is perfumed with the tar of birch, never becomes mouldy; indeed, it prevents it from occurring in other bodies. A few drops of any essential oil will keep books entirely free from it. For harness, oil of turpentine is recommended. Alum and resin are used to preserve bookbinders' paste, but ineffectually; oil of turpentine succeeds better; but, by small quantities of oil of peppermint, anise, or cassia, paste has been preserved for several years. Dr. Macculloch recommends the addition to the flour and water of some brown sugar, and a little corrosive sublimate; the sugar keeping it flexible when dry, and the sublimate preventing it from fermenting, and from being attacked by insects. A few drops of any of the essential oils may be added to the paste when it is made. It dries when exposed to the air, and may be used merely by wetting it. Seeds may also be preserved by the essential oils; and this is of great consequence when they are sent to a distance. Of course, moisture must be excluded as much as possible, as the oils or ottos prevent only the bad effects of mould.

ORIGIN OF GAUGING.

We owe this to accident. On the occasion of Kepler's second marriage, he found it necessary to stock his cellar with a few casks of wine. When the wine-merchant came to measure the casks, Kepler objected to his method, as he had made no allowance for the different sizes of the bulging parts of the cask. From this accident, Kepler was led to study the subject of Gauging, and to write a treatise on it, published at Lintz in 1615, and which contains the earliest specimens of the modern analysis.—*Sir D. Brewster's Martyrs of Science.*

MISTAKES IN BEE-HIVES.

Of far more importance than honey, the quality of which necessarily depends upon the country where it is produced, is the question of Hives. Among the hives shown at the Great Exhibition of 1851 were a great number remarkable for being unsuited to the insects that were to inhabit them. Bees require above all things to be left alone—to be perfectly tranquil; yet here were double hives, with one so drawn over the other, that you could not take off the outer hive without shaking the inner one. Bees require an atmosphere sometimes warm and sometimes cool: and here were hives made

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with ventilating contrivances of pierced zinc, most ingeniously adapted to occupy the time of the bees in filling up the holes when they do not want them, and opening them again when they do. Bees require ready access to their hive in summer, and the means of closing up the access in winter: here were hives made with openings so small that not more than two bees could enter at a time. Bees have enemies to contend with—mice and snails,—tom-tits pop in their heads when they can, and carry the bees off: here were hives apparently contrived for no purpose except to let mice and such creatures in. Bees require an equal temperature,—not over hot in summer, and not over cold in winter: here were hives made of metal plates. Angles in the interior of hives are exceedingly disadvantageous; because in these angles the wax-moth, the greatest enemy to bees, makes a lodgment: here were hives provided with angles, multiplied with singular pains. In short, here was only one small improvement—a thick straw hive, in form like a hemisphere, with a flat board put upon the top. This form is the best adapted to prevent the inroads of wax-moths; it is rather less in diameter at the bottom than it is a little higher up, by which means the comb is kept firm: it is made by Milton, of Marylebone-street, the most skilful of our apiarians. This kind of hive, without the top, was first proposed by Butler, in his admirable *Historie of Bees* published in 1623.—*Dr. Lyon Playfair, F.R.S.*

INVENTION OF GUNPOWDER.

Roger Bacon is reputed to have invented Gunpowder from some detonating mixture of which saltpetre is an ingredient, it being spoken of as commonly known in Bacon's *Opus Majus*. There are other passages in his *De Secretis Operibus*, which expressly mention sulphur, charcoal, and saltpetre as ingredients. But, independently of the claims of the Chinese* and Indians, Marcus Græcus, who is mentioned by an Arabic physician of the ninth century, gives the receipt for gunpowder. The discovery has sometimes been given to Bertholdus Schwarz,† a German monk; and the date of 1320 annexed to it, a date posterior to that which may justly be claimed for Bacon. Upon the authority, however, of an Arabic writer, in the Escurial collection, there seems little reason to doubt that gunpowder

* Gunpowder is stated to have been used in China as early as A.D. 85; and the knowledge of it is said to have been conveyed to us from the Arabs, on the return of the Crusaders to Europe; that the Arabs made use of it at the siege of Mecca, in 690; and that they derived it from the Indians.

† In November 1853, there was erected at Freiburg, in the Grand Duchy of Baden, a stone statue of Schwarz, who was born in the town, and became there a monk in the monastery of the order of St. Francis: he is believed to have died about 1354. The invention is claimed for Schwarz, because he did not learn it from any other person.

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was introduced through the means of the Saracens into Europe before the middle of the thirteenth century; though its use in engines of war was probably more like that of fireworks than artillery. Many authorities might be adduced to show the common use of gunpowder early in the fourteenth century. Its first application to the firing of artillery has been commonly ascribed to the English at the battle of Cressy, in August 1346; but hitherto the fact has depended almost solely on the evidence of a single Italian writer, and the word "gunners" having been met with in some public accounts of the reign of Edward III. The Rev. Joseph Hunter has, however, from records of the period, shown the names of the persons employed in the manufacture of gunpowder (out of saltpetre and "quick sulphur," without any mention of charcoal), with the quantities supplied to the king just previously to his expedition to France in June or July 1346. In the records it is termed *pulvis pro ingeniis;* and they establish that a considerable weight had been supplied to the English army subsequently to its landing at La Hogue, and previously to the battle of Cressy; and that before Edward III. engaged in the siege of Calais, he issued an order to the proper officers in England requiring them to purchase as much saltpetre and sulphur as they could procure.

THE WIND OF A CANNON-BALL.

In 1854 an officer of the French army, sent to make a reconnoissance in the neighbourhood of Sebastopol, was knocked down, not by a cannon-ball itself, but by the wind of it, as the ball passed close to him. The commotion produced was so intense that the tongue of the officer instantly contracted, so that he could not either put it out of his mouth or articulate a word. Subsequently, by the aid of electricity, he recovered his speech.

CONGREVE ROCKETS.

These destructive missiles were invented by Sir William Congreve, the eldest son of Lieut.-Col. Sir William Congreve, whose numerous experiments, made while he was comptroller of the Royal Laboratory at Woolwich, essentially contributed to the success of the invention. These rockets were first employed at the attack of Boulogne, in 1806, by Commodore Owen. The cases are metal, and the carcases have strong iron heads, filled with a composition as hard and solid as iron itself. The range is 3300 yards, or nearly two miles. A 32-pounder penetrates nine feet in common ground, and in bombardments pierces solid walls and penetrates several floors. The Congreve is exclusively a British weapon, and its structure and composition are a profound secret, since they cannot be discovered

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by inspection or analysis. Sir William Congreve, the inventor, died at Toulouse, in May 1828; and was buried there in the Protestant cemetery.

COMPOSITION OF GLASS.

Glass has usually been considered to be a strictly chemical combination of its ingredients, and a very perfect artificial compound. Such, however, is not the case, the alkali in common glass being in a very imperfect state of combination. Thus Mr. Griffiths has shown that if either flint-glass or plate-glass be finely pulverised in an agate mortar, then placed upon turmeric paper, and moistened with pure water, strong indications of free alkali will be obtained. Mr. Faraday considers glass rather as a solution of different substances one in another than as a strong chemical compound; and it owes its power of resisting (chemical) agents generally to its perfectly compact state, and the existence of an insoluble and unchangeable film of silica or highly silicated matter upon its surface.—*Bakerian Lecture, Philos. Trans.* 1830.

In a Roman villa discovered at Boxmoor, Herts, has been found a piece of window-glass of greenish hue, and about three-sixteenths of an inch in thickness: its flat under-surface, and its hammered upper-surface, show this glass to have been manufactured by pouring it in a state of fusion upon a stone slab, and flattening it by repeated blows with a mallet or hammer.

Professor Schoenbein, who invented the gun-cotton, is stated in the *Revue Scientifique et Industrielle* to have, to a certain point, discovered malleable glass! He renders paper paste (papier-mâché) transparent by causing it to undergo a certain metamorphosis, which he calls *Catalytic*, for want of a more intelligible term. He makes of this new paper window-panes, vases, bottles, &c. impermeable to water—and which may be dropped on the ground without breaking—and are perfectly transparent.

VENETIAN GLASS PAPER-WEIGHTS.

This beautiful weight consists of a mass of clear white crystal, inside of which, and embodied in it, are representations in coloured glass of coral, flowers, &c. formed by laying together the fibres of glass of various colours, so assorted that a section across the fibres exhibits the objects to be represented. Winokelmann describes a similar art of the ancients:

There are several varieties of Venetian glass. First and most characteristic is the *Laticinio*, or filigree glass, with coloured threads, generally in opaque milk-white, hence the word *Laticinio*. In some specimens, the threads form lacework glass, or *Vitro di Trina*. *Millefiore* glass is richly variegated with an infinity of eccentric patterns, small stars, circles, &c. *Schmelze* is a semi-opaque glass of a rich variegated brown, green, or bluish colour; and *Avanturine*, with metallic

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filings or levigated leaf-gold suspended in it, is said to have had its origin in the fact of a workman having accidentally (*par aventure*) let fall some brass filings into a crucible of melted glass—hence both the process and the term.—See *Curiosities of Glass-making*, by Apsley Pellatt, M.P.

INVENTION OF PAPIER-MÂCHÉ.

Although this invention bears a French name, it was originally and essentially in material and treatment the product of English ingenuity. It is true that snuff-boxes, cups, and toys, had long been made of *papier-mâché* on the Continent; but the merit of employing it in architectural decoration is thus conceded to England by the author of the article "Sur l'Art de Moulage," *Encyclopédie Méthodique*, Paris 1788, vol. v.: "Les Anglois font en carton les ornemens de plafonds que nous faisons en plâtre." Some years earlier than the middle of the last century, the father of Joseph Wilton, sculptor and Royal Academician, diverged from his original business of a plasterer, and established workshops in Edward-street, Cavendish-square, for the manufacture of papier-mâché ornaments for chimney-pieces and frames for looking-glasses; and he for many years employed several hundred persons in the manufacture. His showrooms were at the south-west corner of Hedge-lane (now Whitcomb-street, Pall Mall east), and the manufacture was followed up by Wilton's son, the Academician. The style of ornament was, however, meagre and petite, rendering it but a poor substitute for moulding and casting in plaster; and by the end of the century the art had so declined, that papier-mâché was mostly confined to tea-trays, upon the painting of which artists of eminence were employed: we have seen a tray with a characteristic group painted by Bird. It was, however, reserved for our times to employ papier-mâché with advantage in decorative design, aided by the powerful operations of the steam-engine in moulding and other processes of the art.—See a tract by Mr. Bielefield, 1840.

SHAGREEN,

named from the Persian *shagri*, is made at Astracan, and was formerly much used for small cases and boxes. The material is the strong skin that covers the crupper of the ass or the horse. In its preparation the roughness is produced by treading into the skin hard round seeds, which are shaken out when the skin has been dried; it is then stained green with copper filings and sal ammoniac, and the grains or warts are then rubbed down to a level with the rest of the surface, which thus presents the appearance of white dots on a green ground.

LACQUER-WARE.

The word *lacquer* is evidently derived from the Indian

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name *lac* or *look*, which is the resin secreted together with the lac-dye by the lac insect, a species of coccus. The name occurs in Avisenna (11th century), who mentions it as the gum of a tree like the myrtle, and as also having some of the properties of amber. It is mentioned in many Indian works, and is apparently alluded to by Ctesias. This substance is used for a variety of purposes in India, and it is the common material for uniting things together, as gum and glue are in Europe. The term *lacquer* is applied to laying on or covering with a preparation of lac. Dampier, in 1638, speaks of "the lac of Tonquin, a sort of gummy juice which drains out of the bodies or limbs of trees," adding that "the articles lacquered are cabinets, desks, &c." Some chemical change no doubt takes place on exposure of these juices to the air. This kind of lacquered ware was much appreciated in the last century, and was chiefly imported from China; much, however, was always prepared in Burmah, though that of Japan was considered superior to any other. All are prepared from the juice of the family of *Terebinthaceæ* plants, the chief expense arising from the care with which the successive layers of varnish must be laid on. Another kind of lacquer-work is somewhat of the nature of papier-mâché, covered with one or more layers of the varnish: such are the lacquered boxes from Cashmere and Lahore, remarkable for the beauty and elegance of their patterns.—*Dr. Royle.*

BERLIN IRON CASTINGS.

Ehrenberg attributes the peculiar fineness of these castings to the iron and sand employed being of a peculiar quality, only to be met with in the neighbourhood of Berlin. The former is made from bog-ore; and the latter is a sort of tripoli, containing a considerable admixture of iron.

THEORY OF THE PUMP.

Air, though comparatively light, is positively heavy, having a weight of its own. A square inch of it, carried up from the surface of the earth to the top of the atmosphere, is no less than 15lb. in weight. It is this weight of the atmosphere, 15lb. on every square inch, that pushes water into the void left by the updrawn piston of a pump; there is, of course, a limit beyond which it cannot push the water—namely, the point of height at which the column of water in the pump-tube is exactly balanced by the weight of the atmosphere. It is just a question of balance: 15lb. can support only 15lb.,—a thing which every body understands now-a-days, thanks to Galileo, Torricelli, and Blaise Pascal, the seer, the discoverer, and the verifier of the fact.—*North British Review*, No. 35.

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"The manner in which water is raised in a common pump was formerly explained by the assumption that nature abhorred a vacuum; and this general expression was applicable to every pump within a certain range. After a time, however, scientific men found that water would only rise to a certain height in pumps, and therefore arrived by induction at the laws of atmospheric pressure. At the Royal Society is a barometer made upon this principle, which shows how high water could be raised by a common pump under varying pressures of the atmosphere."—*A. Smee, F.R.S.*

WHAT IS TIME, AND HOW IS IT MEASURED?

Laplace observes, that "time is to us the impression left on the memory by a series of events, the existence of which we are sure was successive. Motion is suitable to serve as a measure for it; because a body not being capable of being in several places at once, incapable of ubiquity, must in passing from one place to another occupy successively all the intermediate parts. If, at each point of time described, it is animated by the same force, its movement will be uniform, and the portions of that line may measure the time employed in traversing them. It is thus that by motion, in sun-dials, clepsydræ, and modern horology, time is measured."

DIFFERENCE BETWEEN A WATCH AND A CLOCK.

A Watch differs from a Clock in its having a vibrating wheel instead of a vibrating pendulum; and, as in a clock, gravity is always pulling the pendulum down to the bottom of its arc, which is its natural place of rest, but does not fix it there, because the momentum acquired during its fall from one side carries it up to an equal height on the other—so in a watch a spring, generally spiral, surrounding the axis of the balance-wheel, is always pulling this towards a middle position of rest, but does not fix it there, because the momentum acquired during its approach to the middle position from either side carries it just as far past on the other side, and the spring has to begin its work again. The balance-wheel at each vibration allows one tooth of the adjoining wheel to pass, as the pendulum does in a clock; and the record of the beats is preserved by the wheel which follows. A main-spring is used to keep up the motion of the watch, instead of the weight used in a clock; and as a spring acts equally well whatever be its position, a watch keeps time although carried in the pocket, or in a moving ship. In winding up a watch, one turn of the axle on which the key is fixed is rendered equivalent, by the train of wheels, to about 400 turns or beats of the balance-wheel; and thus the exertion, during a few seconds, of the hand which winds up, gives motion for twenty-four or thirty hours.—*Dr. Arnott.*

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Money, etc.

DOMESDAY PRICES.

The Rev. W. Lisle Bowles, in his *History of Bremhill*, makes a few useful observations, suggested by the account in Domesday Book, on the wages and some of the prices of agricultural produce on the farms where the *villani* and *servi* laboured. When we find two oxen sold for seventeen shillings and fourpence, we must bear in mind that one Norman shilling was as much in value as three of ours; and when we find that thirty hens were sold for three farthings each, we must bear in mind the same proportion; the price of a sheep was one shilling, that is, three of ours. Wheat was six shillings a quarter, that would be according to our scale two shillings and threepence a bushel. Now at the time of this calculation, somewhat more than two hundred years after Domesday, *i.e.* in the reign of Edward I. (1299), what were the wages of the labourer? The ploughman's wages were about five shillings a year, fifteen shillings by the present scale; a maid for making "pottage" received a penny a week!

PAST AND PRESENT VALUE OF MONEY.

In reading accounts of the expense of living in past ages, its amount, at first sight, appears almost incredibly low; the reader in few cases rightly estimating the comparative value of money in the past and present times. Thus, the silver shilling in the twelfth century and for some centuries afterwards, weighed three times as much as it now does; and, on account of the scarcity of money, the expense of living varied from one-fifth to one-eighth of what it does at the existing period. The real proportion is continually varying; but, in order to avoid exaggeration, and to arrive at an even sum, 6¾ has been assumed as the general average, and this multiplied by three gives twenty; or, in other words, the value of a certain sum then was equal to twenty times as much as at the present day. From the increasing quantity of the circulating medium, soon after this period the difference in the expense of living decreased to the average of five; and therefore, and for some centuries to come, the multiplier will be fifteen instead of twenty.—*Youatt. on Sheep*, p. 200

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The following Comparative Table of English Money is from Sir Frederick M. Eden's *State of the Poor, &c.* The unit or present value refers, of course, to that of the shilling before the last coinage, which reduced it:

Dates.	Value of Pound sterling present money.	Proportion.
	£ s. d.	
Conquest 1066	2 18 1½	2.906
18 E. I. . . . 1300	2 17 5	2.871
18 E. III. . . . 1344	2 12 5½	2.622
20 E. III. . . . 1346	2 11 8	2.583
27 E. III. . . . 1353	2 6 6	2.325
13 H. IV. . . . 1412	1 18 9	1.937
4 E. IV. . . . 1464	1 11 0	1.550
18 H. VIII. . . . 1527	1 7 6¾	1.378
34 H. VIII. . . . 1543	1 3 3½	1.163
36 H. VIII. . . . 1545	0 13 11½	0.698
37 H. VIII. . . . 1546	0 9 3½	0.466
5 E. VI. . . . 1551	0 4 7¾	0.232
6 E. VI. . . . 1552	1 0 6¾	1.028
1 Mary 1553	1 0 5¾	1.024
2 Eliz. . . . 1560	1 0 8	1.033
43 Eliz. . . . 1601	1 0 0	1.000

In 1299 the price of a fat lamb in London, from Christmas to Shrovetide, was 16*d.* (Stillingfleet's *Chronicum Rusticum*, p. 66.) Three years afterwards the price of a fat wether was 1*s.*, and that of a ewe 8*d.* (Dugdale's *Hist. St. Paul's Cathedral*); and in 1309 there is a notice of an extravagant price given on occasion of an installation feast, when 200 sheep cost 30*l.*, or 3*s.* per head (W. Thorn, in the *Decem Scriptores*). The reader will not much err if he multiplies these sums by 15, as expressive of their proportionate value at the present day.

The following extract from a table exhibiting the progress in the depreciation of money from the Norman Conquest to the end of the eighteenth century (originally constructed for Sir George Shuckburgh Evelyn's *Memoir of a Standard for Weight and Measure*), is from Ruding's *Annals of the Coinage.*

In 1050 the price of wheat per bushel was 2½*d.*, and the cost of an ox 7*s.* 6*d.*; in 1150 wheat was 4½*d.* per bushel, and an ox only 4*s.* 8½*d.*; husbandry labour at the same time was 2*d.* per day. In 1250 wheat was 1*s.* 7½*d.*, and an ox 1*l.* 0*s.* 7*d.*

	s.	*d.*		£	*s.*	*d.*		*s.*	*d.*	
In 1350 wheat	1	10½,	an ox	1	4	6,	labour	0	3	per day.
1450 „	1	5,	„	1	15	8,	„	0	3½	„
1550 „	1	10½,	„	1	16	7,	„	0	4	„
1600 „	4	0½,	„		—		„	0	6	„
1675 „	4	6,	„	3	6	0,	„	0	7½	„
1760 „	3	9½,	„	8	10	0,	„	0	11	„
1795 „	7	10,	„	16	8	0,	„	1	5½	„

The depreciation of money, consequently, compared with the price of wheat (taking it in 1050 at 10), would be represented

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in 1350 by 100, in 1550 by the same, in 1675 by 246, in 1760 by 203, and in 1795 by 426.

According to Child, in his *Discourse on Trade*, the price of land in England in 1621 was no more than twelve years' purchase. Sir Charles Davenant states that in 1666 it had risen to fourteen to sixteen years' purchase. From the accounts of the purveyors of Prince Henry's household, for the early part of the seventeenth century, we learn that, in 1610, the price of beef was about 3½*d.*, and mutton about 3⅝*d.* the pound. In 1619 the price of two cauliflowers was 3*s.*; and among the articles provided a few years previously for the household of James's queen, are a few potatoes charged at 2*s.* a pound. —Abridged from *Notes and Queries*, No. 283.

Numismatists are of opinion that the coins of Henry VII., with the head *in profile*, are the first English money bearing a likeness of the sovereign.

QUEEN ANNE'S FARTHING.

The popular notion that there were only three Farthings struck of Queen Anne, and that consequently they are extremely rare, has occasioned more mischief and mortification to those who have been misled by it than any error of its class. Only one type of the farthing was in circulation; but there are several *pattern-pieces*, executed by Croker, which are much valued by collectors, and accordingly bring high prices. Mr. Till, the coin-dealer, assures us that some hundreds of Anne's farthings were struck and circulated. It bears the bust of the queen, draped, and the head adorned with a string of pearls, with the legend "ANNA DEI GRATIA;" the reverse has "BRITANNIA" around the figure of Britannia, with the spear and olive-branch: the date 1714 in the exergue is stated by Mr. Till to bring from 7*s.* to 12*s.*, "and if extremely fine in preservation, may be worth a guinea. Some are found with a broad rim, and are considered more scarce than the others. I speak of these coins as being in copper." Dr. Dibdin states the value of this farthing to be under 5*s.* Mr. Akerman recognises "the common current farthing of Anne" as scarce, but scarcer with the broad rim.

Mr. E. Hawkins, of the British Museum, has seen a hundred letters from different individuals, in each of which it is stated that the Museum has two of the three reputed farthings, and the writer has the third; and in some instances asks if he is entitled to a reward of 1000*l.* or 2000*l.* Every collector has three or four specimens; the Museum has four in gold, four in silver, and eight in copper.

The five pattern-pieces are as follow:

1. ℞. Britannia, as usual, with date 1713 in the legend. Ex. blank.
2. ℞., as last, but with date 1714 in the ex. Both these, Mr. E. S.

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Taylor (*Notes and Queries*, No. 265,) says, "are comparatively common, and were probably current. They have a broad milled edge, exactly similar to the farthings of George III."

3. Q. ANNA AVGVSTA. Ry. Peace in a *biga*, with an olive-branch, and the *hasta pura*, or pointless spear, in her hand. Ex. 1713.

4. Obv. as Nos. 1 and 2. Rev. Britannia seated under an arch. Ex. 1713.

5. Legend of both sides, indented on a broad rim, like the early pennies of George III. Rev. Peace standing with olive-branch and spear: BELLO. ET. PACE. Ex. 1713.

Mr. Akerman thinks the high prices brought by the *pattern-pieces* (varying from 1*l.* to 3*l.*, and the highest, at an auction, 5*l.*), may have given rise to the notion of the fabulous value of the farthing itself. One of the current stories is, that a lady in the north of England having lost a farthing of Queen Anne which she much prized as the bequest of a deceased friend, offered in the newspapers a large reward for its recovery; and any farthing of that monarch was ever after supposed to be of great value. Then, it is related that when only three farthings had been struck, it was perceived that a flaw existed in the die, which was destroyed, and another made, from which are the farthings which have circulated. Of the *three*, one is said to have been kept by Queen Anne, and to have descended to George III., who gave it to the British Museum. The second was long in the possession of the Derby family, and thence passed into the Museum; and the third is said to have been given by Queen Anne to one of her maids of honour, and is now in the possession of her descendant, Major Fothergill. Each of these three farthings has a flaw in Anne's portrait. (See *Illustrated London News*, Oct. 7, 1854.)

The romantic disappointments of the possessors of "Queen Anne's farthings" would fill a volume. In the *Times*, Sept. 28, 1826, a magistrate related that a poor man came to London from Bedfordshire, with a real but common farthing of Queen Anne, hoping to make his fortune by it. Mr. Till relates that a poor man came from York, and a man and his wife from Ireland, in the same vain hope. Dr. Dibdin, when on his Northern Tour, was shown a Queen Anne's farthing by a father, as a 500*l.* legacy for his son.

TESTOR, OR TESTON.

The coin of silver termed a "teston" originated in Italy, afterwards was introduced in England *temp.* Henry VII., in his nineteenth year, A.D. 1504, and thence into France *temp.* Louis XII., A.D. 1513,—so named from having the king's head, *teste* or *tête*, impressed thereon. Scotland also had a coin of the same denomination, *temp.* Mary, 1553 to 1560. In England, *temp.* Henry VII., the value of the teston was about one twenty-sixth of the Tower mark fine, and that of Louis XII. about one

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twenty-sixth of that of Paris; but *temp.* Henry VIII. it became so reduced as to be worth (1545) not more than one-fourth of its original value of 12*d.* The teston had great cause to blush, in England, in 1551, from the excessive debasement it underwent; and again, *temp.* Elizabeth, 1560. Hence, perhaps, the origin "of read testons," mentioned in Heywood's *Epigrams*, from the redness of their complexion, being composed the greater part of copper.—*W. Webster, the Numismatist.*

CHARACTERISTICS OF A BANK-OF-ENGLAND NOTE.

Very little alteration has been made in the appearance of the Bank-of-England Note since it was first issued at the end of the seventeenth century; but the quality of the paper, and the engraved writing, have been brought to a high degree of excellence.

The paper has been made since 1719 at the same mill at Laverstoke, in the picturesque valley of the Test, in Hampshire, where about 50,000 notes are made daily.* The paper is distinguished: 1. By its peculiar *white colour.* 2. Its *thinness and transpareney*, preventing any of the printed part of the note being washed out by turpentine, or removed by the knife without making a hole. 3. Its *characteristic feel*, crisp and tough, by the touch of which can be distinguished true from false notes. 4. Its *wire-mark* or *water-mark*, produced in the paper in a state of pulp (the mark is stamped upon counterfeit paper after it is made). In the water-marking, heretofore the device or water-mark was produced by an infinite number of wires stitched and sewn together,—now it is engraved in a steel-faced die, which is afterwards hardened, and is then used as a punch to stamp the pattern out of plates of sheet brass.† In this mark, the letters and figures are shaded, which produces artistic effect, and increases the difficulty of forgery. 5. The three *deckle edges* of the Bank-notes made in pulp. 6. The *strength* of the Bank-note paper, it being made entirely from *new* linen and cotton pieces: when unsized, a Bank Note will support 36 lb.; when sized, it will lift 56 lb.

The notes are surface-printed from electrotypes. The Britannia was designed by Mr. Maclise, R.A., and cut in steel by Thompson; and from this moulds are made by striking it upon pure soft lead. The originals are never employed in printing, but are simply used as mould-makers, from which

* To the lover of beautiful nature, who can hang a thought on every thorn, the situation of this Bank-note paper-mill,—this manufactory of money,—"*opes irritamenta malorum*," amidst these scenes of rural quiet, is suggestive of reflection a thousandfold.

† In a pair of Five-Pound Notes prepared by the old process, there were 8 curved borders, 32 figures, 168 large waves, and 240 letters, separately secured by 1056 wires, 67,584 twists, and the same repetition where the stout wires were introduced to support the under surface.

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electro-casts are taken by the use of Smee's ordinary battery and precipitating trough. For wooden moulds gutta percha is generally employed, the surface being black-leaded. The printing-ink is made at the Bank, of linseed-oil and the charred husks and vines of Rhenish grapes, forming Frankfort black, a velvety black, very distinguishable in the left-hand corner of the note. The paper is here thicker, to enable it to take a better and sharper impression of the vignette; in a counterfeit note, the paper is of equal thickness all over. Again, the paper is considerably thicker in the dark shadows of the centre letters, and the figures at the ends. Inks in forgeries are usually bluish, or brown. The Bank-notes are printed 3000 per hour, at a Napier's steam-press. Lastly, the signatures are printed at the same time by the electrotype process.

"The individuality is given by a number and date being added to the denomination.

"The number is of no use alone; the date is of no use alone; but the number, date, and denomination conjointly mark the specific individual; and any person having these particulars can learn at the Bank to *whom* the note was issued, and *when* it was issued; the date of its *return* to the Bank, and the *person* to whom the money was *paid* for it, &c.

"It is not generally known to the public, that there are letters preceding the numbers of every note; and which, with the number, tell the whole story of it."

The protectives against counterfeit and alteration are: 1. Peculiarities in the pulp or manufacture of the paper. 2. Chemical preparations, introduced at the time of manufacture or subsequently. 3. Water-marks, or devices for distinguishing any given paper from all others. 4. The style and subject of the engravings; and 5. The inks used in printing.

The practice of splitting a Bank-note can never be used for fraudulent purposes, because the printed surface is that which receives the water-mark; consequently the other, or unprinted surface, could not retain more than the faintest trace of it.

The Bank issues nine millions of notes per annum, representing nearly three hundred millions of money.

LIFE-ASSURANCE.

Perhaps one of the most remarkable examples of the value of general laws is to be found in Life-Assurances; for what apparently can be more precarious and uncertain than the duration of life in any individual? Yet, in the aggregate, mortality is so regular, that it has been said by an eminent mathematician, that there is no investment so certain as that of a prudently conducted Assurance Society. If we take 5000 persons in the prime of life, 600 die in the first ten years, 700 in the second ten years, 850 in the third. The experience under different circumstances varies but little, as Jenkin Jones, Neisson, and Farren, have shown; and it is a curious fact, that

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lives which might be called first-class are as prone to disease as those which appear to belong hardly to so high a class.—*A. Smee, F.R.S.*

WHAT IS A BILLION?

or, rather, what conception can we form of such a quantity? We may say that a Billion is a million of millions, and can easily represent it thus: 1,000,000,000,000. But a school-boy's calculation will show how entirely the mind is incapable of conceiving such numbers. If a person were able to count at the rate of 200 in a minute, and to work without intermission twelve hours in the day, he would take to count a billion 6,944,444 days, or 19,325 years 319 days. There are living creatures so minute that a hundred millions of them might be comprehended in the space of a cubic inch. They are supplied with organs and tissues, nourished by circulating fluids, which must consist of parts or atoms, in reckoning the size of which we must speak, not of billions, but perchance of billions of billions. And what is a billion of billions? The number is a quadrillion, and can be easily represented thus: 1,000,000,000,000,000,000,000,000; and the same school-boy's calculation may be employed to show that to count a quadrillion at the rate of 200 in the minute would require all the inhabitants of the globe, supposing them to be a thousand millions, to count incessantly for 19,025,875 years, or more than 3000 times the period during which the human race has been supposed to be in existence.—Professor Low, in *Jameson's Journal*, No. 106.

THE NATIONAL DEBT.

Towards the middle of the 17th century, as the principle of credit came into use in the mercantile communities of Italy, Holland, and England, the governments of Europe gradually relinquished their old custom of extorting "benevolences," "aids," &c. from their people, and began to borrow money for public exigencies, binding the State to pay for what they borrowed a certain rate of interest per annum till the money was repaid, or the debt, to use the language of financiers, redeemed. From about that period all the governments of Europe have had small or large debts. Charles I. borrowed largely from his partisans; but all his debts were extinguished by the Revolution, and it was under his sons that the foundations of a permanent debt were laid in England. On the accession of William III. the Debt, however, was only 664,263*l.*, and the annual charge only 39,855*l.* During his reign the system of credit was expanded throughout Europe: he was mainly supported by the moneyed classes and townspeople; his throne was not founded on hereditary right, he could not, like the Stuarts

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and the Tudors, extort from the people at his will; and he accordingly defrayed a large part of the annual expenditure by borrowing money, and pledging the State to pay annual interest on it. At the end of William's reign, the Debt was 15,730,439*l.*, and the annual charge on account of it 1,271,087*l.* From his time the same process has been continued. In all exigencies, such as war, the large payment on account of Negro Emancipation, the Famine in Ireland, &c. the Government has borrowed money, and mortgaged its future revenue to pay the interest. In periods of peace, and when the rate of interest has been low, it has redeemed small portions of the Debt, or it has lowered the annual charge by reducing, with the consent of the holders, the rate of interest. The last change of this kind was when Mr. Gladstone paid off the debt of the South Sea Company in 1853-4, which he was obliged to do by his proposal to convert it not having been favourably received.

The annexed table, copied from Mr. M'Culloch's edition of Smith's *Wealth of Nations*, is an account of the progress of the Debt in outline, to which is added its amount at this time. The debt consists of several species of loans, or funds, with different denominations, which have been in process of time variously mixed and mingled, such as Consols, *i.e.* several different loans consolidated into one stock—3 per cents Reduced, New 3 per cents, &c. The unfunded debt consists of Exchequer bills issued from year to year, and continued or renewed by the Treasury, to supply temporary wants, bearing a rate of interest, corresponding to, but generally lower than, the rate of discount in the commercial money-market; and Exchequer bonds, first issued by the Treasury in the beginning of 1854, which are loans at a fixed rate of interest for a short period, and then to be repaid.

The following is the Account of the Principal and Annual Charge of the Public Debt at different periods since the Revolution:

	Principal, funded and unfunded.	Interest and management.
Debt at the Revolution in 1689	£664,263	£39,955
Excess of Debt contracted during the reign of William III. above debt paid off	15,730,439	1,271,087
Debt at the accession of Queen Anne in 1702	16,394,702	1,310,942
Debt contracted during Queen Anne's reign	37,750,661	2,040,416
Debt at the accession of George I. in 1714	54,145,363	3,351,358
Debt paid off during the reign of George I. above debt contracted	2,053,125	1,133,807
Debt at the accession of George II. in 1727	52,092,238	2,217,551
Debt contracted from the accession of George II. till the peace of Paris in 1763, three years after the accession of George III.	86,773,192	2,634,500
Debt in 1763	138,865,430	4,852,051
Paid during peace from 1763 to 1775	10,261,795	280,460
Debt at the commencement of the American war in 1775	128,568,635	4,471,571
Debt contracted during the American war	121,267,998	5,066,338

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	Principal, funded and unfunded.	Interest and management.
Debt at the conclusion of the American war in 1784	£249,851,628	£9,500,907
Paid during peace from 1784 to 1793	10,501,380	249,277
Debt at the commencement of the French war in 1793	239,350,148	9,311,630
Debt contracted during the French war	601,500,343	22,704,311
Total funded and unfunded debt on the 1st of February 1817, when the English and Irish exchequers were consolidated	840,850,491	32,015,941
Debt cancelled from 1st February 1817 to 5th January 1849	59,033,152	3,894,319
Total debt and charge thereon 5th January 1849	791,817,339	28,121,622

Between 1849 and 1854 there was a continual reduction of debt. The total amount accordingly on the 1st of April 1854 was 768,664,249*l.*, viz. 752,655,549*l.* funded debt and 16,008,700*l.* unfunded debt. In 1854 the debt was again augmented by loans to carry on the war, and again in 1855.

The following is an exact statement of its amount, taken from the finance returns, on March 31, 1857, since when the changes in the debt have been unimportant:

	Capital.	Annual charge, including expense of management.
	£	£
Total funded (780,119,723*l.*) and unfunded debt (Exchequer bills 20,989,000*l.*, Exchequer bonds 7,000,000*l.*) on March 31st, 1857	808,108,723	28,543,132

FALLACIES OF STATISTICS.

Archbishop Whately remarks upon the overrated importance of Statistics:

Increase of a thing is often confounded with our increased knowledge of it. When crimes or accidents are recorded in newspapers more than formerly, some people fancy that they happen more than formerly. But crimes, especially (be it observed) such as are the most remote from the experience of each individual, and therefore strike him as something strange, always furnish interesting articles of intelligence. I have no doubt that a single murder in Great Britain has often furnished matter for discourse to more than twenty times as many persons as any twenty such murders would in Turkey. Some foreign traveller in England is said to have remarked on the perceptible diminution in the number of crimes committed during the sitting of Parliament as a proof of our high reverence for that assembly; the fact being, as we all know, that the space occupied in the newspapers by the debates causes the records of many crimes to be omitted. Men are liable to form an overestimate of the purity of morals in the country as compared with a town, or in a barren and thinly-peopled as compared with a fertile and populous district. On a given area, it must always be expected that the absolute amount of vice will be greater in a town than in the country, so also will be that of virtue; but the proportion of the two must be computed on quite different principles. A physician of great skill and in high repute, probably loses many more patients than an ordinary practitioner; but this proves nothing till we have ascertained the comparative numbers of their patients. Mistakes such as this (which are very frequent) remind one of the well-known riddle, "What is the reason that white sheep eat more than black ones?"

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Art-Terms.

ETRUSCAN POTTERY.

A CONTRIBUTOR to the *Edinburgh Review* says: "Let any one recollect the ugly forms of our ordinary crockery and potters' ware forty or fifty years since, when the shapes were as deformed as that of the pipkin which cost Robinson Crusoe so much trouble, and observe the difference since the classical outlines of the Etruscan vases have been adopted as models of our Staffordshire ware." It has, however, been shown by Mr. Birch, in his valuable *History of Ancient Pottery*, that this very prevalent idea respecting the influence of Etruscan pottery on modern art is a mistake. As a writer in the *Saturday Review* with justice remarks: "famous as the Etruscans were for their terra-cotta works, very little has come down to us except their vases; and of these the earliest and original never attained a high character, and have not supplied patterns for modern imitation. It is the later examples, bearing manifest evidence of Greek taste and influence, which have been adopted as models. The strange permanency of these antique designs is, however, very remarkable. The taste which is now discarding all other forms but those fashioned upon a Gothic model, and sets a value upon them for their supposed antiquity, is introducing an innovation of yesterday compared with the patterns it supplants."

ANCIENT AND MODERN ENAMEL.

Six leading varieties of Enamel have been adopted at various periods: 1. *The Byzantine process*, temp. Justinian, to about 1300, consisting chiefly in the formation of casements or cavities for the reception of the enamel by means of the gold filigree. 2. *Early Limoges style*, practised in that city from the eleventh century until the siege and massacre by the Black Prince; substituting for the filigree compartments of the Byzantine mode excisions formed in the thick copper-plate by the graver. 3. *Early Italian mode*, circ. 1280 to 1600, held a midway position between the ancient "champ levé," or incised, and the painted enamels afterwards produced; consisting of engraving silver after the manner of medallic relief, and then floating over

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it with variously coloured transparent pastes. 4. Benvenuto Cellini, if he did not invent, at least first described, the improvement in the beginning of the sixteenth century called "*jewellers' enamel*,"—gold or silver objects in the round, or "in high relief," covered with glass-powder, and water in which pips of pears had been steeped; this held the paste in its place until vitrification took place, not interfering with the perfect purity of the enamel. 5. *Late Limoges*, invented by Leonard Limousin, under the auspices of Francis I.; the surface of the metal entirely covered with an opaque paste, painted with transparent colours, regaining the effect of a translucent ground by applying silver leaf fastened with a glass of colourless enamel, and then tinting over it: *peinture grisature*, and touching with gold, are varieties. 6. *The Miniature style*, Sir Theodore Mayerne and Petitot, principal masters; improved by the addition of new pigments, multiplied number of firings and succession of tints, their hardness and fusibility, by the addition of fluxes, &c. Unhappily, the mystery which many selfish artists have thrown over their modes renders them exceedingly difficult to analyse or describe.—*Digby Wyatt, F.S.A.* (abridged).

MAJOLICA WARE.

This ware is named from the fact that painted pottery first came into Italy through the expedition against Majorca, in the twelfth century, when Moorish pottery formed part of the spoils. What we now know as Majolica Ware proper belongs mainly to the fifteenth and sixteenth centuries. The earlier specimens of it are called mezza-Majolica. Majolica is sometimes termed Raffaelle Ware, but improperly so: Raffaelle may have painted some of these pieces with his own hands, and his compositions are found upon many of them; still, the best works in this manufacture were not produced till after the death of Raffaelle. The Bernal Collection, dispersed in 1855, contained about 400 pieces of Majolica ware, which cost Mr. Bernal less than 1000*l.*, but realised at the sale 7000*l.*

MALACHITE

is considered by Sir Roderick Murchison to be a wonderful subterraneous incrustation, which was produced in the stalagmitic form, during a series of ages, by copper solutions emanating from the surrounding loose and porous mass, and trickling through it, to the lowest cavity, upon the subjacent solid rock. At the bottom of one of the shafts of the copper-works of the Ural, 280 feet deep, there was found, a few years since, an enormous mass of Malachite, sending off strings of green copper-ore: it was estimated to contain 15,000 poods, or half-a-million pounds of pure and compact Malachite. This fine

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emerald-green mineral is extensively used for veneering and inlaid work; its value, when manufactured, is upwards of three guineas per pound, and a square foot of finished work generally contains at least two pounds and a half.

MARQUETRIE

is the production of an imitative object by inlaying with wood veneers of different colours, natural or dyed; the picture being enriched by engraving, scorched with hot sand in parts that require shadow, and finally polished. The use of woods of different growth causes, in time, through their unequal contraction, &c., an imperfect surface and defective joinings, as is evident in nearly all old Marquetrie. To prevent this, white veneers of one wood have been used, and dyed each part to the required colour.

PAINTED AND STAINED GLASS.

These terms are often confused. M. Jules Labarte, in his valuable *Handbook of the Arts of the Middle Ages and Renaissance*, thus points out the difference:

"There is a great difference between colouring glass and painting upon it. The coloured glasses are obtained by mixing metallic oxides with glass in a state of fusion, by which means a uniform colour is given to the whole mass. This colouring is not superficial, it pervades the substance of the glass, the colouring matters becoming incorporated by fusion with the vitreous mass. This process produces what is called stained glass, which must not be confounded with painted glass. To obtain the latter the artist makes use of a plate of translucid glass, either colourless or already tinted in the mass, and gives the design and colouring with vitrifiable colours upon one or both surfaces. These colours, true enamels, are the product of metallic oxides, which give the coloration, combined with vitreous compounds known by the name of fluxes. These fluxes serve as vehicles for the colours, and it is through their medium, assisted by the action of a strong heat, that the colouring matters are fixed upon the plate of glass and incorporated with it."

THE "LOST" RED FOR GLASS-PAINTING.

The whole secret of the production of Red Glass in every way equal to the ancient mode consists in this: though the *deutoxide* of copper, when melted with glass, gives a green or sky-blue colour, the *protoxide* gives the red in question; this, by reflected light, is dingy, but by transmitted light, beautifully splendid. Great skill and practice is required, to prevent the copper, while the glass is in fusion, from taking up the additional dose of oxygen, and thus passing from red to green. Again, glass, though containing the proper oxide of copper when first taken out of the pot, often shows only a dirty-greenish hue; but if it be exposed for a few minutes to a dull red heat, a fine red tint will be thrown out. Modern artists use the red from

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silver, which was unknown to the ancients, but will not bear comparison with the old red.

ANCIENT AND MODERN PAINTED GLASS.

The observed difference between the coloured glass of the windows of old churches and that of modern art is entirely due to age and imperfections in manufacture. Mr. Faraday considers that any irregularities tend to produce the diffusion of the rays which permeate the glass; and the opacity of ancient church-windows is probably from a superficial change of the external surface. Again, old glass, by repolishing, may be rendered as transparent as any modern glass. The beautiful colours of old glass we are inclined to refer to the passage of light through it, often for hundreds of years, which produces a mellowing effect not to be imitated by the processes of art.

THE PORTLAND VASE.

This celebrated Vase, the property of the Portland family, has been deposited in the British Museum since 1810.

The Portland Vase was found about 1560, in a sarcophagus in a sepulchre under the Monte del Grano, 2½ miles from Rome. It was deposited in the palace of the Barberini family until 1770, when it was purchased by Byres, the antiquary; and sold by him to Sir William Hamilton, of whom it was bought, for 1800 guineas, by the Duchess of Portland, at the sale of whose property it was *bought in* by the family for 1029*l*. The vase is 9¾ inches high and 7¼ inches in diameter, and has two handles. It is of glass; yet Breval considered it calcedony; Bartoli, sardonyx; Count Tetzi, amethyst; and De la Chausse, agate. It is ornamented with white opaque figures upon a dark-blue semi-transparent ground; the whole having been originally covered with white enamel, out of which the figures have been cut, like a cameo. The glass foot is distinct, and is thought to have been cemented on after bones or ashes had been placed in the vase. The seven figures, each five inches high, are said by some to illustrate the fable of Thaddeus and Theseus; by Bertolli, Proserpine and Pluto; by Winckelmann, the nuptials of Thetis and Peleus; Darwin, an allegory of Life and Immortality; others, Orpheus and Eurydice; Fosbroke, a marriage, death, and second marriage; Tetzi, the birth of Alexander Severus, whose cinerary urn the vase is thought to be; while the late Thomas Windus, F.S.A., in a work published 1845, considers the scene as a love-sick lady consulting Galen. The vase was engraved by Cipriani and Bartolozzi in 1786; copies of it were executed by Wedgwood, and sold at fifty guineas each, the model for which cost 500 guineas: there is a copy in the British and Mediæval Room, at the British Museum.

The Portland Vase was exhibited in a small room of the old Museum buildings until Feb. 7, 1845, when it was wantonly dashed to pieces with a stone by one William Lloyd; but the pieces being gathered up, the Vase has been restored by Mr. Doubleday so beautifully, that a blemish can scarcely be detected. The Vase is now kept in the Medal Room at the British Museum. A drawing of the fractured pieces is preserved.

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CAMEOS.

The ancients formed Cameos by engraving figures in low relief on different kinds of silicious stones, generally those which had layers of different colours; so that the figures appeared on differently coloured grounds. Such Cameos are now made in Southern Europe and in France, but the hardness of the material renders them very expensive. Porcelain and glass have been substituted; but the most successful are shells, which afford the requisite difference of colour, and are soft enough to be worked with ease. The shells are those of the Flesh-eating Univalve, selected by the Cameo-cutter for their three layers of different colours; together with the Bull's Mouth, the Black and Horned Helmets, and the Queen's Conch; and many thousand pounds' worth of these Cameos are made every year in Paris.

THE ART OF MOSAIC.

Mosaic is named from *opus musivum*, *musaicum*, *mosaicum*, perhaps because Mosaic pavements were principally employed in temples dedicated to the Muses. It is also called *opus tessellatum* and *vermiculatum*, because the cubes of which it is composed are disposed in curved lines.

A mosaic is a painting executed by means of small cubes, called *sectilia* and *tesseræ*, of marble, glass, or stones of various colours, set in a bed of cement or mastic, in figures of arabesques, scrolls, rosettes, or figures, and even entire historical and mythological compositions. The work is then polished, not too highly, else the reflected lights would glitter on every part of the surface. The age of a mosaic may be determined by the nature of the materials employed—the more numerous these are, the more modern the mosaic. The beauty and perfection of the drawing, and the merit of the composition, are also excellent indications. Glass was scarcely employed till under the Roman empire in the decoration of apartments, roofs, and walls; it is of great importance in the ornamentation of churches built by the new Greek architects of the Byzantine school. Besides pictures in mosaic, there are mosaics in relief, borrowed from the Greeks; and the coloured cubes being set up, as types are by printers, in figures detached from gold grounds.

THE STYLE OF THE RENAISSANCE.

An artistic writer in the *Builder*, No. 637, sensibly observes:

There are few architectural terms more abused than this; for we see it employed, with a sort of vague and indeterminate application, to designate every variety and date of revived Roman architectural forms, except the purely classical, including in the same category the dawning efforts of Brunelleschi, the matured compositions of Alberti and Palladio, the eccentricities of our own Elizabethan, the vagaries of the Louis Quatorze school, and even the noble creations of Wren. If we use the term according to its simple meaning, its application is not difficult. At the second birth or dawn of the new taste in architecture old forms and

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arrangements, hallowed by association and tradition, could not all at once be got rid of. The plan and mode of construction, particularly in churches, remained for a time the same as before, the only difference consisting in the applied ornament and decoration. After a while further and more radical changes took place, which led to the entire abandonment of mediæval forms. Now it is to this transition period, when architecture was drifting with the new current, but had not yet lost sight of the ancient land-marks, that the term of Renaissance more particularly applies, and for which it would be difficult to find a more appropriate name.

"Le style de la Renaissance (says M. de Caumont, in his *Abecedaire d'Archéologie*) a son caractère propre. Les architectes du seizième siècle n'imitèrent pas servilement l'architecture antique dans ses formes et ses dispositions. Les ordres superposés, les revêtements de marbre, furent, avec ceux que nous allons indiquer, les principaux caractères de la Renaissance lorsque cette architecture fut introduite."

WHAT IS PRE-RAPHAELITISM?

Pre-Raphaelitism, according to the explanation of it given by its champion, Mr. Ruskin, is intended to combat the tendency of modern art to the pursuit of beauty at the expense of manliness and truth; and the servile imitation of the Post-Raphaelite painters, to the neglect of the exact imitation of nature, thus resting in an imperfect reproduction of eclectic merit, which must result in conventional mannerism, and hinder, if not prevent, the artistic discovery and reproduction of new truth from the inexhaustible fountain of nature herself. To escape from this tendency, "the Pre-Raphaelite Brethren," as they style themselves, propose to follow the track of art from its infancy: in the words of Lord Lindsay, the student must "ascend to the fountain-head; he must study Duccio and Giotto, that he may paint like Taddeo di Bertolo and Masaccio;—Taddeo di Bertolo and Masaccio, that he may paint like Perugino and Lucca Signorelli;—and Perugino and Lucca Signorelli, that he may paint like Raphael and Michael Angelo." Mr. Ruskin repudiates the idea of the Pre-Raphaelite artists imitating any pictures: he avers that "they merely oppose themselves to the modern system of teaching; and paint nature as it is around them, with the help of modern science, and with the earnestness of the men of the thirteenth and fourteenth centuries." He has, however, more recently gone to a much greater extreme: for instance, he insists that mediæval art was *religious*, and all modern art is *profane;* that mediæval art *confessed* Christ, while modern art *denies* Christ.

Against this schism in art it is objected that its very title is a misnomer; for, judging from their works, we may well say with Mr. Ruskin himself, that "these Pre-Raphaelite pictures are just as superior to the early Italian in skill of manipulation, power of drawing, and knowledge of effect, as inferior to them

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in grace of design; and that, in a word, there is not a shadow of resemblance between the two styles." And even if there are errors in the modern system of teaching, they do not prove it to be wrong, by availing themselves of it only so far as it gives mere skill in exact technical imitation, and rejecting its higher principles; while professing to substitute a style in which these technical merits do not exist, but whose qualities of grace, purity, beauty, and expression they almost entirely miss. Let us have, if possible, closer study of nature, and more conscientious imitation of her; but why should the artist, more than the poet, resign his noble prerogative of educating his mind and eye to the appreciation of all that she offers of tender or lovely, expressive or beautiful, and not merely to discover what is commonplace, vulgar, mean, and ugly? Why should he not even do what nature herself refuses to do, unite for harmony or contrast many diverse beauties together, provided he cull the flowers from nature herself, and they be not artificial? Again, these painters profess to imitate nature, and eschew the plagiarism of modern art; yet they go back to a period when the almost only excellence was expression, which they do not reproduce, while they borrow much that is merely grotesque. Not that the ancient painters intended it to be so; but it was the nearest approach to the imitation of nature which their imperfect scientific and technical resources permitted them to make. The truth appears to be, that there is some analogy between the progress of art and science,—every step has been the vantage-ground for further progress,—both are infinite, and no one mind can master every branch of either; still, by following the natural inclination, a proper use of the knowledge of what has already been done, and the conscientious study of nature, there will ever be room for originality.

The religious spirit of early art being the product of totally different tendencies from those of modern society, we can no more recall it than we can return to the manners and customs and entire mode of thinking of that age. As Mr. Leslie happily says: "The spirit of Chaucer is not to be caught by adopting his phraseology, or by printing in black-letter; so neither shall we catch the spirit of any school or master by adopting that from it which is merely temporary."

This English revival appears but a feeble echo of a similar movement in Germany. Overbeck in Rome, and Cornelius at Munich, are its leaders. But the Germans have undoubtedly the advantage in taste, manliness, and vigour. They have, moreover, caught much of the expression and religious feeling of the early masters, without at the same time sacrificing their own independence.*

* Communicated by Mr. T. J. Gullick, portrait-painter.

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TERRA COTTA.

Terra Cotta (literally *baked clay*) is of great antiquity. Vases of this material 2000 years old have been found in Etruscan tombs free from stain and bright in colour, painted black, red, buff, and yellow, and sometimes gilded, ornamented with laurel, ivy, and honeysuckle, with mythological scenes or paintings of domestic life. Terra Cottas of the early Greek type are found in Egypt, and all parts of Sicily and Magna Græcia. The art of making them became extinct about 150 years B.C. In the seventeenth century terra-cotta works, in conjunction with architecture, were frequent in Italy, and were used by Bramante. The brick Tudor mansions of England were also adorned with terra-cotta ornaments the work of Italian artists. Wedgwood, about 1770, revived the manufacture of terra cotta in England, employing Flaxman, the greatest British sculptor. In 1790 Coade and Sealey produced large architectural works at Lambeth. Terra cotta is now extensively manufactured by Minton and Blashfield.

ANTIQUITY OF COPPER-PLATE ENGRAVING.

In the peninsula of India, the art of Engraving upon plates of copper appears to have been practised long before the Christian era. It was there customary to ratify grants of land by deeds of transfer actually engraven on plates of copper, as we now write them on skins of parchment. A copy of one of these relics is given with an English translation by Mr. Wilkins in the *Asiatic Researches*, vol. i. p. 123. It is in the Sanscrit language, and bears date twenty years before the birth of Christ.

ENGRAVING ON WOOD.

Mr. Chatto, in Jackson's work on Wood-Engraving, makes the golden age of the art commence with Albert Durer; but it has been proved that Wood-engraving more probably began with the unknown artist who executed the cuts for Breydenbach's travels when Albert was but a boy. Mr. Chatto appears to be more correct in stating Albert Durer to have been "the greatest promoter of the art of wood-engraving towards the close of the fifteenth and in the early part of the sixteenth century; not, however, as is generally supposed, from having himself engraved the numerous wood-cuts which bear his mark, but from his having thought so well of the art as to have most of his greatest works engraved on wood from drawings made on the block by himself."

ANASTATIC PRINTING

is the *ἀνάστασις* (the first raising up) of copies from a printed sheet of paper, whether letter-press or engraving; this is first

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moistened with dilute nitric acid, and then pressed with considerable force by a roller on a clean surface of zinc. The acid with which the unprinted part of the paper is saturated *etches* the metal, and the printed portion *sets off*, so that the zinc surface presents a complete reverse copy of the work. The prepared plate is then washed with a solution of gum in weak phosphatic acid; the liquid is attracted by the etched surface, which it freely wets, while it is repelled by the oil of the ink in which the writing or drawing on the plate is traced. A leathern roller covered with ink is then passed over the plate, when a converse effect ensues. The repulsion from the oil, ink, and the watery surface prevents any soiling of the *unfigured parts* of the zinc plate, while the attraction between the oil and oil causes the ink to be distributed over the printed portions. The anastatic plate is now complete, and impressions are pulled from it by the common lithographic press.

COST OF THE GREAT PYRAMID OF EGYPT.

Mr. Tite, the architect, states the original dimensions of the Great Pyramid near Gizeh to have been 764 square feet at the base, and 480 feet of perpendicular height; covering 43 acres, 1 rood, 22 perches of ground. It consumed 89,028,000 cubic feet of stone; and Mr. Tite adds, that it could not now be built for less than thirty millions sterling! The joints of the large casing blocks of granite were so fine as to be scarcely perceptible, not thicker than paper; and the mortar was so adhesive, that the stones in some cases broke through their substance rather than give way at their jointing.

PLYMOUTH BREAKWATER.

This great artificial island or mole in the centre of Plymouth Sound is not less than one mile long. It contains no fewer than three and a half millions of tons weight of rubble stone, quarried in the adjacent hills, and deposited in the sea at a depth of from thirty-six feet below low-water mark to ten feet above high-water mark. Besides this there is a dressed stone pier or platform along the top, containing two and a half millions of cubic feet of dressed stone. The cost was a million and a half of sterling money, and the work has no parallel in the hydraulic architecture of any kingdom. Some idea of the mass of stones combined together to form the Plymouth Breakwater may be formed by imagining that, if piled up over the area of Trafalgar-square, London, they would form a pyramid 600 feet high—a height exceeding that of Nelson's monument standing on the top of St. Paul's.—*Sir John Rennie, F.R.S.*

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Language and Books.

THE SANSCRIT LANGUAGE.

SANSCRIT, according to H. T. Colebrooke, signifies the 'polished dialect.' It is sometimes written *Shanscrit*, and also *Sanskrit*. It is a dead language; and Sir William Jones has said of it "that it is more flexible than Greek, more copious than Latin, and more exquisitely refined than either." It is the source of all the spoken dialects of India; and although more difficult than Greek, yet, as its structure bears the closest resemblance to that of the classical languages, a knowledge of it may be acquired with considerable facility by a Greek or Latin scholar.

The word 'Sanskrit' (संस्कृत, *sanskrita*) is made up of the preposition *sam* (सं=*συν, con*), 'together,' and the passive participle *krita* (कृत=*factus*), 'made,' a euphonic *s* being inserted. The compound means 'carefully constructed,' 'symmetrically formed' (*confectus, constructus*); in this sense it is opposed to 'Prâkrit' (प्राकृत, *prâkrita*), 'common,' 'natural,' the name given to the vulgar dialects which gradually arose out of it.—*Williams's Sanskrit Grammar*, second edition, 1857.

STYLE OF HERODOTUS.

Perhaps few persons are aware how often they imitate this great historian. "Children and servants," said a writer in the *Edinburgh Review*, in 1828, "are remarkably *Herodotean* in their style of narration. They tell every thing dramatically. Their *says he* and *says she* are proverbial. Every person who has had to settle their disputes, knows that, even when they have no intention to deceive, their reports of conversation always require to be carefully sifted. If an educated man were giving an account of the late change of administration, he would say, 'Lord Goderich resigned; and the king, in consequence, sent for the Duke of Wellington.' A porter tells the story as if he had been behind the curtains of the royal bed at Windsor: 'So Lord Goderich says, "I cannot manage this business; I must go out." So the king, says he, "Well, then, I must send for the Duke of Wellington—that's all."' This is in the very manner of the father of history." Mr. Dickens's "Sarah Gamp" is a choice specimen of this Herodotean manner.

ANALYSIS OF THE ENGLISH LANGUAGE.

The English language consists of about 38,000 words. This

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includes, of course, not only radical words, but all derivatives, except the preterites and participles of verbs; to which must be added some few terms, which, though set down in the dictionaries, are either obsolete, or have never ceased to be considered foreign. Of these, about 23,000, or nearly five-eighths, are of Anglo-Saxon origin.* The majority of the rest, in what proportions we cannot say, are Latin and Greek: Latin, however, has the larger share.

It will thus be seen that the Anglo-Saxon, even if we look at the mere number of words, has contributed our principal source of strength. Sharon Turner, from our most popular writers, adduces a much greater preponderance of the Anglo-Saxon element; but he has not set down in figures the numbers of the two classes of words contained in any of these passages. Sir James Mackintosh analysed three or four of them. We now give an analysis of the whole. The passages in question are from the Bible, Shakspeare, Milton, Cowley, Thomson, Addison, Spenser, Locke, Pope, Young, Swift, Robertson, Hume, Gibbon, and Johnson. In five verses out of Genesis, containing 130 words, there are only 5 not Saxon. In as many verses out of the gospel of St. John, containing 74 words, there are only 2 not Saxon. Of the remaining passages, that from

		Not Saxon.
Shakspeare	81	13
Milton	90	16
Cowley	76	10
Thomson	78	14
Addison	79	15
Spenser	72	14
Locke	94	20
Pope	84	28
Young	96	21
Swift	87	9
Robertson	114	34
Hume	101	38
Gibbon	80	31
Johnson	87	21

In none of these passages is the number of foreign words greater than one-third; in many of them less than one-tenth. In all there are 1492 words, of which only 206 are not Saxon. Taking this as a criterion, the Saxon would constitute about four-fifths of the language, instead of five-eighths, or about thirty-two fortieths, instead of twenty-five fortieths.—*Edinburgh Review*, No. 141.

WHAT IS THE CHARACTER OF CHAUCER'S DICTION?

To this question, a writer in *Blackwood's Magazine* replies: "A great delusion exists upon this point. Some ninety or a hundred words that are now obsolete, certainly not many more, vein the whole surface of Chaucer; and thus a *primâ facie* impression is conveyed that Chaucer is difficult to understand,

* Dr. Bosworth, the eminent Anglo-Saxon scholar, has published a work by King Alfred in the original Anglo-Saxon and in an English version. The text is from two existing manuscript copies: the subject is a description of Europe, Asia, and Africa, with the voyages of Obthere and Wulfstan.

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whereas a very slight practice familiarises his language." This is considered by an able illustrator* of our vernacular poet to be a sufficiently fair popular view of the subject. "The real state of the case," he adds, "is this. At the time Chaucer wrote there were two languages in this country co-existent—the Saxon part of our modern language, and the Norman part, which people mixed just in the degree they liked,—that is to say, one who wrote for the people used a great deal of Saxon, and comparatively little Norman; and one who wrote for fashionable society used much Norman and little Saxon. Chaucer, of course, belonged to the latter class. The Saxon words have been becoming more extensively obsolete than the Norman; while the Norman words, even if they are not still in use in our modern form of the language, are generally intelligible to us in consequence of their having representatives in Latin and in modern French. The consequence is, that the language of a courtier like Chaucer is much more intelligible than that of any popular writer of his own time."

THE OLDEST ENGLISH PRINTED BOOK.

Bartholomæus de Glanville, who flourished about the middle of the fourteenth century, wrote *De Proprietatibus rerum*, which was first printed in folio by Caxton in 1480. It was translated into English by Trevisa, and printed by Wynkin de Worde in 1507. Dr. Dibdin, in his *Typographical Antiquities*, styles this "a volume of extraordinary typographical beauty and rarity." It is the first book printed on paper made in England.

ARISTOTLE'S HISTORY OF ANIMALS.

Dr. Osborne, in 1840, read to the Royal Society a short analysis of this work, in which he showed that Aristotle anticipated Dr. Jenner's researches respecting the cuckoo; as also some discoveries respecting the incubated egg, which were published as new in the above year. Aristotle's observations on fish and cetaceous animals are extremely curious, as might be expected from the variety of these animals in the Grecian seas. Those on insects it is difficult to appreciate, from uncertainty as to the names. Aristotle describes the economy of bees as we have it at present; but mistakes the sex of the queen. The various organs are described as modified throughout the different classes of animals (beginning with man) in nearly the same order as that afterwards adopted by Cuvier.

In Spratt and Forbes's *Travels in Lycia*, the account of the habits and structure of the cuttle-fish, in Aristotle's work, is ranked among the most admirable natural-history essays ever written.

* Thomas Wright, M.A., F.S.A., &c.

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"If (say the authors) we bring together all that Aristotle records of these creatures in the several books of the History of Animals, we cannot fail to appreciate the position of the Stagyrite, as the greatest of naturalists, past and present; for none among them all ever combined such extraordinary powers of observing equally the structure of the individual and the habits of the species with the highest capacity for generalisation. Each fact narrated by Aristotle seems always to be told with reference to some law floating, as it were, before his mind's eye, and to be fixed through the determination of the instance. Every thing, too, is told in perfect good faith: hearsay narrations are related as such, and carefully distinguished from personal observations; a feature which places the natural-history writings of Aristotle on a par with the highest productions of modern science. This cannot be said of any other ancient author who has treated of similar subjects. The philosophical spirit which pervades the History of Animals distinguishes it from, and elevates it above, the great majority of the natural-history writings of the moderns, and renders the study of that great work a sound course of reading in the education of the student of natural history: or rather, such should be; for, unfortunately, the acquaintance of too many modern naturalists with the writings of the Stagyrite is confined to the bare knowledge of the existence of his memorable History."

The chief value of this body of knowledge, which has been buried for above 2000 years, is, that it is a collection of facts observed under peculiar advantages, such as have never since occurred, and that *it is at the present day to be consulted for new discoveries.*

According to Pliny, for the above work some thousands of men were placed at Aristotle's disposal throughout Greece and Asia, comprising persons connected with hunting and fishing, or who had the care of cattle, fish-ponds, and apiaries, in order that he might obtain information from all quarters, *ne quid usquam gentium ignoretur ab eo.* According to Athenæus, Aristotle received from the prince, on account of the expenses of the work, 800 talents, or upwards of 79,000*l.*

BOOKWORMS.

In paper, leather, and parchment, are found various animals, popularly known as "Bookworms." The larvæ of *Crambus pinguinalis* will establish themselves upon the binding of a book, and, spinning a robe, will do to it little injury. A mite (*Acarus eruditus*) eats the paste that fastens the paper over the edges of the binding, and so loosens it. The caterpillar of another little moth takes its station in damp old books, between the leaves, and there commits great ravages. The little boring wood-beetle also attacks books, and will even bore through several volumes. An instance is mentioned of twenty-seven folio volumes being perforated, in a straight line, by the same insect, in such a manner that, by passing a cord through the perfect round hole made by it, the twenty-seven volumes could be raised at once. The wood-beetle also destroys prints and drawings, whether framed or kept in a port-

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folio. "The Death-watch"* is likewise accused of being a depredator of books. These details were collected by the experienced keeper of the Ashmolean Museum at Oxford, in 1841.

FERDINAND MENDEZ PINTO, "PRINCE OF LIARS."

"Ferdinand Mendez Pinto was but a type of thee, thou liar of the first magnitude," says Foresight to Sir Sampson Legend, in Congreve's *Love for Love*, act ii. sc. 5; and Cervantes has designated Pinto as "the prince of liars." He was a Portuguese traveller of no great veracity, though he did not deserve all the ill language applied to him by the wits. Addison and Steele, in the *Tatler*, No. 254, thus pleasantly notice Pinto, and another traveller of equal veracity.

"There are no books which I more delight in than travels, especially those that describe remote countries, and give the writer an opportunity of showing his parts without incurring any danger of being examined and contradicted. Among all authors of this kind, our renowned countryman, Sir John Mandeville, has distinguished himself by the copiousness of his invention, and the greatness of his genius. The second to Sir John I take to have been Ferdinand Mendez Pinto, a person of infinite adventure and unbounded imagination. One reads voyages of these two great wits with as much astonishment as the travels of Ulysses in Homer, or of the Red Cross Knight in Spenser. All is enchanted ground and fairy land."

THE HORNBOOK.

Books have been called the tools of education. Dr. Watts defines them as "a sort of dumb teachers: they cannot answer sudden questions, or explain present doubts; this is, properly, the work of a living instructor." Yet few are insensible to the aid of a good book in the business of teaching,—an advantage which the skill of our times has multiplied almost beyond the limit of calculation; so that it is difficult to conceive how tedious must have been the teaching of little children by such rude means as the Hornbook common in the last century. A specimen met with in 1850, among the old stock of a bookseller at Peterborough, in Lincolnshire, is thus described: Its dimensions are 9 by 5 inches. The alphabet, &c. are printed upon white paper, which is laid upon a thin piece of oak, and is covered with a sheet of horn, secured in its place by eight tacks, driven through a border or mounting of brass; the object of this horn-covering being to keep the "book," or rather leaf, unsoiled. The first line is the cross-row; so named, says Johnson, "because a cross is placed at the beginning, to show that the end of learning is piety." Shakspeare has a reference to this line:

* The ticking or clicking of the Death-watch (a timber-boring beetle) is now known to be the call of the insect. The superstition that the ticking was a death-omen is mentioned by Baxter in his *World of Spirits*. Blumenbach refers the name of one species to its lying *as though dead* when touched.

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> "He hearkens after prophecies and dreams;
> And from the cross-row plucks the letter G;
> And says, a wizard told him that by G
> His issue disinherited should be." *Richard III.*

Again, in *Love's Labour's lost*, act v. scene 1, Moth, the page to Armado, says, in describing Holofernes the schoolmaster, "He teaches boys the Hornbook."

In the library of the British Museum is a specimen of the Hornbook: the press-mark is 828 a 55; and it is described in the catalogue as "Hornbook, the alphabet, Syllabarum, Lord's Prayer, &c. written in black-letter, in imitation of the type and orthography employed in the first half of the sixteenth century." This descriptive entry is considered to be a forgery. If this were correct, it would place the use of the Hornbook at an earlier date than that of the Primer (*Primarius*, Latin), a small prayer-book in which children were taught to read,—so named from the Romish book of devotions. In 1545 Henry VIII. ordered to be printed an English "form of Public Prayer," entitled the *Primer*, said to be "set furth by the Kinge's majestie and his clergie, to be taught, lerned, and red." A copy of this rare book is extant: it was once the property of Sir John Clark, priest of the chapel of Leedsbridge, and founder of the school. This appears from the following autograph note in the Calendar: "This day I began the schole at Leeds, July 4, 1563."

In *Notices of Fugitive Tracts and Chap-books*, by Mr. James Orchard Halliwell, F.R.S. (printed for the Percy Society, 1849), is engraved a Hornbook, in black-letter, of the time of Queen Elizabeth. "Hornbooks are now so completely out of use," says Mr. Halliwell, "that few persons are acquainted with their precise nature. The present one, which appears to be at least as ancient as 1570, is mounted on wood, and protected with transparent horn. There is a large cross, the *criss-cross*, and then the alphabet in large and small letters. The vowels follow next, and their combinations with the consonants; and the whole is concluded with the Lord's Prayer and the *Roman* numerals. The Arabic numerals are not given."*

The Hornbook is also described by Ben Jonson:

> "The letters may be read, *through the horn*,
> That make the story perfect."

Cotgrave has, "*La Croix de par Dieu*, the Christ's-crosse-rowe, or *horne-booke*, wherein a child learnes it;" and Florio,

* John Britton, who was born in the parish of Kington St. Michael's, Wilts, in 1771, tells us, in his *Autobiography*, that he was placed with a schoolmistress: "here," he writes, "I learnt 'the Christ-cross-row' from a Hornbook, on which were the alphabet in large and small letters, and the nine figures in Roman and Arabic numerals. The Hornbook is now a rarity."

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ed. 1611, p. 93, "*Centuruola*, a childes horne-booke hanging at his girdle."

"Commether, *Billy Chubb*, an breng tha hornen book. Gee ma the vester in tha windor, you *Pal Came !*—what ! be a sleepid—I'll wâke ye. Now, *Billy*, there's a good bway ! Ston still there, and mind what I da zâ to ye, an whaur I da point. Now ; cris-cross, girt â, little â—b—c—d. That's right, *Billy ;* you'll zoon lorn tha criss cross-lain—you'll zoon auvergit Bobby Jiffry—you'll zoon bo *a scholard* A's a pirty chubby bway—Lord love'n !"—*Specimens of the West-Country Dialect.*

"Hornbooks are now," concludes Mr. Halliwell, "of great rarity ; and even modern ones are very seldom seen. I have been told, on good authority, that an advertisement, many times repeated, offering a considerable sum for a specimen, failed in producing an answer. A tale, illustrative of Lord Erskine's readiness, relates that, when asked by a judge if a single sheet could be called a book, he replied, 'The common Hornbook, my lord.'"

At the meeting of the Archæological Institute, held at Oxford in 1850, there were exhibited two genuine Hornbooks of the reigns of Charles I. and II. These curious relics were from the collection of Sir Thomas Philipps, at Middlehill.

Locke, in his *Thoughts upon Education*, speaks of the "ordinary road of the Hornbook and Primer." We find both mentioned in one of the lists of the old booksellers on London Bridge,—"Edward Winter at the Looking-Glasse :" "Testaments, *Primers*, Psalters, *Hornbooks*, Grammers." The title of Hornbook has also been otherwise applied than to a schoolbook : thus, we have Dekker's *Gull's Hornbook* (1609), a satiric guide to the fashionable follies of the Town, and showing, among other things, "How a Gallant should behave himself in Paul's Walk." And we read of one W. T. Playtes issuing a prospectus of *The Hornbook for the Remembrance of the Signs of Salvation*, in 12 vols. 8vo, with 365,000 marginal references, or 1000 for every day in the year.

Shenstone, who was taught to read at a dame-school, near Halesowen, in Shropshire, in his delightfully quaint poem of the *Schoolmistress*, commemorating his venerable preceptress, thus records the use of the Hornbook :

> "Lo ; now with state she utters her command ;
> Eftsoons the urchins to their tasks repair ;
> Their books of stature small they take in hand,
> Which with pellucid horn secured are
> To save from finger wet the letters fair."

Cowper thus describes the Hornbook of his time :

> "Neatly secured from being soiled or torn
> Beneath a pane of thin translucent horn,

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A book (to please us at a tender age
'Tis called a book, though but a single page)
Presents the prayer the Saviour deigned to teach,
Which children use, and parsons—when they preach."
Tirocinium, or a Review of Schools, 1784.

We have somewhere read a story of a mother tempting her son along the cross-row by giving him an apple for each letter he learnt. This brings us to the gingerbread alphabet of our own time, which appears to have been common a century and a half since:

"To master John the English maid
A Hornbook gives of gingerbread;
And, that the child may learn the better,
As he can name, he eats the letter." *Prior.*

In the original picture by Schidone, and formerly in the gallery of the Earl of Ashburnham, we see the Italian Hornbook of the sixteenth and seventeenth centuries, at which period the painter lived. In this fine composition, the girl in the foreground holds a Hornbook, which has beneath the cross-row the Lord's Prayer in Latin, &c. the whole within a border of pleasing design. The sandaled feet and flowing robe of the girl give the picture a classical character; a chubby boy is looking over her right shoulder; and in the distance, beneath the arcade of a temple, are two other learners, who, by their studious air, are interesting accessories to the main design. The picture is popularly known as "the Hornbook;" and was beautifully engraved in 1816 by Robert Cooper, the impressions being in the schedule of prizes in Tomkin's Picture Lottery.

The Hornbook was not always mounted on a board; many were printed on the horn only, or pasted to its back, like one used five-and-forty years ago by a friend, when a boy at Bristol.

Such was the rudeness of the "dumb teacher" formerly employed at the dame-school and elsewhere. It was, in all probability, superseded by the "Battledore" and "Reading-made-Easy," with which came the Alphabet illustration; though the Spelling-book is considerably older than either. The Battledore, by the way, reminds us of a strategy of tuition mentioned by Locke: "By pasting the vowels and consonants on the sides of four dice, he has made this a play for his children, whereby his eldest son in coats has played himself into spelling."

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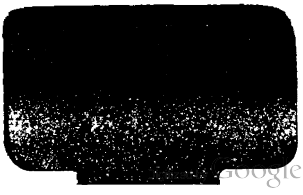
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